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Elevators and Escalators: The Study of an Innovative Approach to Teaching Fingerboard Geography to Heterogeneous String Classes

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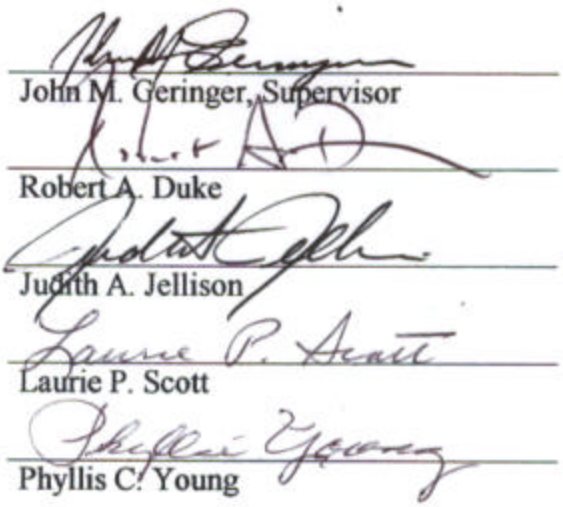

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Elevators and Escalators: The Study of an Innovative Approach to Teaching Fingerboard Geography to Heterogeneous String Classes

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Dissertation

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Dedication

To my parents and family, who always give me encouragement and support, and to the many music teachers who have shared their gifts with me.

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I would like to thank the following people for their encouragement and academic support while I have worked on my degree at the University of Texas: Dr. John Geringer, Ms. Phyllis Young, and Dr. Laurie Scott.

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Elevators and Escalators: The Study of an Innovative Approach to Teaching Fingerboard Geography to Heterogeneous String Classes

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This study examined the effects of a unique teaching approach on middle school string students' ability to navigate the string fingerboard. Instruction involved the use of the terms elevators and escalators to teach chromatic finger patterns on one string and between all strings. The participants (N=57) in the study were beginning string students enrolled in three middle school classes in Austin, Texas.

Students were divided into three instructional groups: video elevator/escalator instruction, worksheet elevator/escalator instruction, and traditional method book instruction. Elevators were defined as finger patterns that occurred between all strings. Escalators were defined as finger patterns that involve consecutive notes on one string or one string and the adjacent string.

Groups were compared using a general music note reading test and a performance test. No significant differences were found between the groups in the ability to name the notes on their instruments. On the performance test, there was no significant difference between the groups in performance ability. No significant differences were found in the number of errors that each group made during the performance of the pretest or posttest. A significant difference was found between the worksheet group and method book group in performance of escalators.

An ancillary aspect of this study was the comparison of two advanced high school seniors who began instruction at the same time and had been taught using two different instructional methods. One participant had been taught using the elevator/escalator approach, and the other participant had been taught using a traditional method book approach. Although both participants achieved approximately the same performance level, the students used slightly different approaches when learning a new selection of music.

Table of Contents

List of Tables

List of Figures

Chapter 1: INTRODUCTION

There are many ways that one may approach teaching a new skill. Determining the most effective method for students to learn a new skill requires comprehensive understanding of the task and often the ability to perform the task. In music, a variety of methods have been used to teach new skills.

The ability to perform on a stringed instrument is a complicated endeavor that involves control of the body. The playing of a stringed instrument is generally divided by pedagogues into left hand skills and right hand skills. The focus of this dissertation is to investigate a method for teaching left hand fingering skills for use in a heterogeneous string class.

Since the 1930's, a number of method books have emerged for use with heterogeneous string classes. Although each method is designed to meet the needs of group instruction, each book takes a different approach for developing skills. In 1912, Mitchell published his *Class Method*. The next publications that are still available are Maddy and Giddings' *Universal Teacher* (1926) and Herfurth's *A Tune a Day* (1927).

Following the introduction of strings into the school curriculum in the early twentieth century, several classroom methods were introduced. In 1960, Applebaum wrote the *String Builder*. In 1961, Müeller and Rüsch published the *Müeller-Rüsch String Method*. These two books were the dominant books of the 1960's and 70's. Anderson and Frost introduced *All for Strings* in 1985. Dillon,

Kjelland, and O'Reilly introduced *Strictly Strings* in 1992. Allen, Gillespie, and Hayes wrote the *Essential Elements for Strings* in 1995. Gazda and Stoutamire wrote *Spotlight on Strings* in 1997.

Each of these method books provides a way for teachers to systematically instruct groups of students. Each book takes a slightly different approach when introducing concepts to the students. The choices of key centers, finger patterns, and the introduction of note reading are some of the differences in the books. One limitation of each of the entry-level books is the amount of time spent on two strings and in one or two key centers. The majority of the exercises in these books concentrate on consecutive notes on one string and the adjacent string. This type of exercise is valuable to beginning string player, but many students are not able to transfer the skills to other strings.

One of the long-term goals of string teaching is to provide information and practice to students so that they may become independent learners. In order to do this, teachers must provide exercises that will foster independent playing among their students. Independence may be defined as the ability of the student to expressively perform a selection of music with rhythmic and melodic accuracy without guidance. Students must be able to navigate the fingerboard in order to produce the musical elements that the composer intended. To have control of the fingerboard, students must have an understanding of the arrangement of the notes

and also must be able to perform the notes and patterns with technical and rhythmic proficiency.

PURPOSE OF THE STUDY

The purpose of this research is to investigate the effects of an innovative approach to teaching chromatic finger patterns to beginning string students. The approach is divided into two parts: "escalators" and "elevators." Throughout this project, the terms "elevator" and "escalator" are used to describe techniques for teaching chromatic finger patterns on the stringed instruments. Escalators are finger patterns that occur on one string or one string and an adjacent string. Elevators are prescribed finger patterns that occur between all of the strings.

William Dick and Laurie Scott developed the elevator and escalator approach to the fingerboard. This method of teaching fingerboard geography is included in their unpublished method, *Mastery for Strings: String Technique for School Orchestra, Studio Instruction, and College Method Courses* (2000). These two educators are from Austin, Texas, and each has over twenty years of experience teaching beginning string students.

Through the elevator and escalator exercises, students explore the positions of the fingerboard and the relationships between strings. This approach allows students to understand the note relationships between all four strings in a relatively short amount of time. Based on informal observations, many of the

students who have received the elevator and escalator instruction are able to demonstrate understanding of the string fingerboard in a more detailed way than students who have been taught using only a method book. Once students can perform the elevators and escalators in first positions, the exercises may be moved to different positions on the instrument to help students understand the fingerboard comprehensively.

ELEVATORS AND ESCALATORS

Each escalator begins with a whole step, and it continues with three additional half steps. On the violin and viola, the first escalator on the D string is comprised of the notes D E F F$^{\#}$ G. In this pattern the second finger slides from the F to the F$^{\#}$. The second escalator begins with the first finger in place. This escalator is E F$^{\#}$ G G$^{\#}$ A. In this pattern, the third finger slides from G to G$^{\#}$. The final escalator on the D string begins with the second finger in place. This escalator is F$^{\#}$ G$^{\#}$ A A$^{\#}$ B, and it involves the sliding of the first finger from A# to B. The student should name the notes and perform them on his/her instrument. Through these three escalators, the student is able to practice the chromatic alterations in the first position on the violin and viola. A notated example of the escalators may be found in Figure 1.

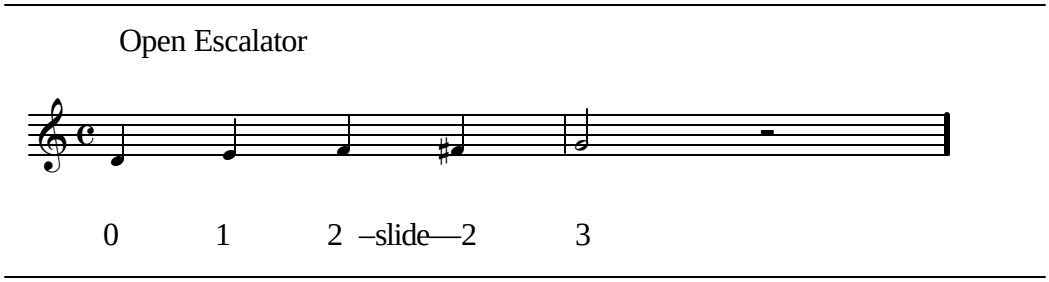


Figure 1. Open Escalator on D string for Violin

Elevators assist students with the understanding of the notes of the fingerboard across strings. The elevator involves finger patterns that occur between all four strings of the instrument. An open elevator on the violin would be G D A E. The second elevator involves the open string and first finger on each string. This elevator is G A D E A B E $F^{\#}$. A notated example of this elevator may be seen in Figure 2. The next elevator involves the minor finger pattern on each string. This elevator would be G A B^{b} D E F A B C E $F^{\#}$ G. The major elevator on the violin is G A B D E $F^{\#}$ A B $C^{\#}$ E $F^{\#}G^{\#}$. The perfect fourth elevator for the violin is G A B C D E $F^{\#}$ G A B $C^{\#}$ D E $F^{\#}$ $G^{\#}$A. Although they were not used in the current research, two additional elevators may also be incorporated into the elevator/escalator approach: the minor second and whole tone. The minor second elevator is G A^{b} D E^{b} A B^{b} E F. The whole tone elevator begins with each open string. It is G A B $C^{\#}$ D E $F^{\#}$ $G^{\#}$ A B $C^{\#}$ $D^{\#}$ E $F^{\#}$ $G^{\#}A^{\#}$. Once each of these

elevators is mastered, the student is able to play the entire chromatic scale in first position.

Open and First Finger Elevator

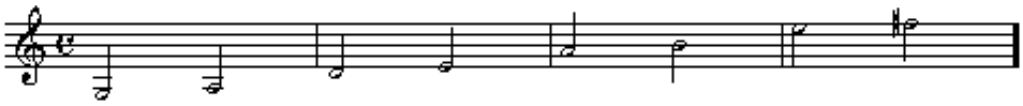


Figure 2. Open and First Finger Elevator for Violin

The present study was designed to investigate the effects of elevator and escalator practice on students' ability to navigate the string fingerboard. The study involved three instructional groups. One group received elevator and escalator instruction presented through videotapes. A second group received instruction using elevator and escalator worksheets. The third (control) group received instruction on chromatic finger patterns using a method book.

An ancillary aspect of the project included a case study of two students who had studied the violin for a similar length of time and have achieved similar results in regard to repertoire and technical facility. One was taught with a method book approach to fingering, and the other was taught using the elevator and escalator method. The students were interviewed, and they sight read a musical

selection. Observations were made regarding the choices made by these two students as they approached a new piece of music.

RESEARCH QUESTIONS

Main Study

1. Are there differences between students who receive method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on written tests of note naming and finger placement?
2. Are there differences between students who receive method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on performance tests incorporating chromatic finger patterns?

Ancillary Study

3. Does an advanced high school student who has been trained using the elevator and escalator approach to the fingerboard make different fingering choices than an advanced high school student trained using a method book approach when sight-reading a new selection of music? Do the students use different finger patterns when approaching the new musical selection and demonstrate knowledge of the relationship of notes across the strings?

ASSUMPTIONS AND LIMITATIONS OF THE STUDY

The main study was limited to (57) students who were enrolled in beginning string classes at two middle schools in Austin, Texas. It was assumed that all participants had achieved approximately the same level of proficiency on their instruments since they had been playing for the same amount of time and received the same amount of instruction. Inferences drawn from this study concerning the effects of mode of instruction with the instructional material used in the study should be examined through further research. Caution should be exercised when making generalizations to other settings.

Chapter 2: REVIEW OF LITERATURE

Playing a stringed instrument involves coordination of many muscles of the body. The development of muscle coordination is generally divided by pedagogues into two parts—right hand and left hand. The right hand is responsible for control of the bow. The essential roles of the bow are articulation, dynamics, and style. The left hand controls primarily pitch and vibrato.

To develop right-hand and left-hand skills, string teachers have created a variety of activities and exercises. These exercises have been developed over many years of study. Teachers use a combination of many exercises to facilitate learning of string students.

Left hand skills are of particular interest in the present research. In particular, the focus is on developing chromatic finger patterns in left hand. The ability to understand and navigate the string fingerboard is an important skill that fosters independence among string musicians. Of further interest are methods for teaching chromatic finger patterns in heterogeneous class groupings.

This review of literature will focus on the development of materials and ideas for the development of the left hand. The review will discuss the following: 1) influential pedagogues and their approach to left hand skills, 2) materials designed for instruction of pre-service teachers, and 3) instructional methods developed for use with heterogeneous string classes. A review of the pedagogues and their contributions to string teaching is important. The materials and ideas

that they incorporated are influential on the continued development of new materials and in preparing future teachers. Another portion of the review will discuss the origin and movement of string classes into the public schools. This is important because the inclusion of classes into the general school curriculum created a demand for materials for use with heterogeneous string classes.

INFLUENTIAL PEDAGOGUES AND LEFT HAND DEVELOPMENT

Materials used in the development of left hand skills include etudes, scale studies, solos, and other techniques that attempt to foster an understanding of the fingerboard. Many string teachers have developed these materials over many years of teaching. Several influential pedagogues have written specific information that concerns the development of left hand skill and agility.

Demetrius Constantine Dounis

One influential pedagogue is Demetrius Constantine Dounis who was born in Athens, Greece. Dounis' was trained to be a medical doctor, but his passion was music. Early in his career he began to doctor the musicians in symphonies in New York, Los Angeles, London, and Paris. Dounis diagnosed physical problems that were encountered by professional musicians. He worked with the musicians for a minimum of six lessons over a six-month period. The first appointment began with a conversation that would help Dounis understand the problem and

help the musician to become at ease with his approach. Following the initial conversation, the musician performed a piece of repertoire for Dounis. Dounis then had the opportunity to assess any physical problem. Following the observation, Dounis asked questions of the musician to help lead him or her to the solution to the problem. Dounis thought that this type of discovery method was beneficial to the musician (Kievman, 1989).

Dounis corrected problems without directly telling the student what the problem was. This method of teaching was a trademark of Dounis. An example of this style of teaching is noted in the narrative below:

> If a player didn't have his left hand under the violin far enough to play squarely on the lowest string, Dounis would not point this out. . . .If he had suggested moving the left arm farther to the right, tension might appear in the left shoulder joint. So, instead, he would give the student an exercise for the fourth finger to be placed on the lowest string. By placing the emphasis on the fourth finger, attention was drawn from the left elbow, which was the real problem (Kievman, 1989, p. 743).

Dounis' most significant contribution to string pedagogy was *The Artist's Technique of Violin Playing* (1921). The book was divided into two sections, left hand and the bow. The section for the left hand was divided into the following sections: 1) Shifting, 2) Exercises for the highest development of the muscles of the hand and fingers, 3) How to practice scales, 4) The technique of double-stop playing, 5) Chords of three and four notes, 6) Harmonics, and 7) Pizzicato. (Dounis, 1921).

In the foreword of the *Artist's Technique* (1921), Dounis stated that he thought most violinists go about practicing the wrong way. He indicated that most violinists practice by repeating the same scales, arpeggios, and bow exercises. Dounis wrote that the "true technical training of the violinist is not merely a training of the arm and fingers, but principally, a training of the brain and memory" (Dounis, 1921, p. 4). Rather than begin a practice session with scales, Dounis advocated the use of shifting and finger exercises that allowed the brain to build mental images that would be beneficial when scale practice began.

The contributions of Dounis to the area of string pedagogy have had a lasting impact on teachers' approach to bow and left-hand technique. His main treatise on violin playing contained many technical exercises that were designed to train musician's left-hand technique. Sequential mental image connections were the main outcomes that Dounis sought from the use of his materials.

Phyllis Young

Phyllis Young's written contributions to string pedagogy are primarily focused on her two books, *Playing the String Game: Strategies for Teaching Cello and Strings* (1978) and *The String Play: The Drama of Playing and Teaching Strings* (1986). Both are how-to books designed to help public school teachers, private teachers, and university music majors. They contain hundreds of specific teaching devices that have proven successful in her teaching students of various age and advancement levels. The books give the exact words the teacher

can say to guide the student in discovering the position, action, or kinesthetic sense required to execute a specific string technique. In the acknowledgements, she names several people who have had great influence on her teaching.

The opening of chapter 4 in *Playing the String Game* (Young, 1978) begins with the following words which is the core of her teaching strategies:

> Almost every physical action required in string playing, when isolated from all others, is similar to one that has been experienced by the student sometime or somewhere else in everyday life. Except for very young children who learn best through imitation anyway, the large majority of students have a vast background of experiences—either firsthand or vicariously through television or the movies.
>
> By calling forth an instant picture or feeling from the enormous storehouse in the brain, the teacher has at her disposal an immense library of practical materials applicable to string pedagogy. Within a few seconds the teacher and student will have communicated, and music making can be resumed. A bonus is that the student's remembrance of the instructions has been made easier because of the association with something that was already a part of himself (Young, 1978, p. 8).

In *The String Play* (Young, 1986) she developed 185 "scenes" to assist with technical development of string players most especially of the intermediate level of advancement. Each scene describes a musical setting, cues to use, the suggested words a teacher can use to guide the student, and the "inner drama" of the scene in which she explains the pedagogical principles in traditional terms. In the "Opening Notes" she refers to the scenes as follows:

> Each is rooted in at least one basic principle which underlies the techniques and musicianship of the most advanced player. The same silk thread which runs through the intricate, complex tapestry of the artist can be woven into the apprentice's sampler. The person who instinctively approaches the instrument in such a manner that these principles are at

> work is quickly labeled "talented." Experience tells us that the number of people accredited with this positive attribute can be multiplied many times if these basic principles are set into motion (Young, 1986, p. xi).

Young's philosophy and pedagogical approach involves a careful evaluation of the sounds a student makes and how they are made. She focuses on the development of an expressive and beautiful tone while instilling sound fundamentals of string playing. She places emphasis on the kinesthetic feelings that the student will experience in order to avoid tension, which she considers to be an enemy of a beautiful tone.

Many strategies for the building of left hand technique and hand and arm positions that make them possible to execute with ease are introduced in *Playing the String Game* (Young, 1978). Especially unique are the two chapters devoted to the development of a beautiful vibrato. In the "Fingerboard Theater" chapter of *The String Play* (Young, 1986) she uses metaphors, and sometimes even objects, to provide a picture of how the left hand should look and feel when involved in specific techniques such as shifting, vibrato, extensions, double stops, trills, and fast runs. No printed musical examples are in either book but all her strategies are intended to be incorporated into the music being studied in the lesson or class.

Paul Rolland

Paul Rolland was born in Hungary and was educated at the Franz Liszt Academy in Budapest. Many of the ideas of his teaching career are documented in a five-year study (1966-1971) that was supported by the U.S. Office of Education. The result of this project is a book entitled *The Teaching of Action in String Playing* (1974). This publication includes a series of seventeen films that cover topics from the first two years of string instruction (Liu, 1990).

Rolland's philosophy of string teaching promotes "rhythmic foundation and movement free from excessive tension" (Liu, 1990, p. 193). From the very beginning of instruction, learning activities are planned so that a solid foundation was laid for later concepts. Rolland felt that students lacking a strong sense of rhythm would have a difficult time developing as a string player because movement would be uncoordinated. Because of this belief, Rolland incorporates rhythmic training into all parts of his teaching. Rolland also believes that all of string playing involved body balance. This balance is achieved through alternating movements. Rolland explains that every movement had a contrary reaction. The body makes this type of movement in order to remain in balance (Rolland, 1970).

Every aspect of Rolland's method of teaching involves some type of movement. The movements focus on "correct position, free movement, and healthy tone production" (Liu, 1990, p. 193). Shifting and vibrato are introduced in the beginning lessons. These movements are introduced through the use of "shuttles" and tapping exercises. These movements are the movement of the hand

and arm from the low, middle, and high playing positions. The shuttle helps eliminate any tension or fatigue that the hand may encounter. A tapping motion in each of the playing positions allows the student to emulate the vibrato motion.

Foster (1996) wrote about Rolland's quiet demeanor in lessons. Rolland would often show new techniques or correct problems by "a gentle hand on the forearm, a visual demonstration, miming in the air, a few directive words, a reminder to involve the whole body, a little more physical guidance" (Foster, 1996, p. 45). Foster stated that Rolland's teaching seemed at first as "random touches of magic," but when taking Rolland's string pedagogy class at the University of Illinois, Foster realized that Rolland was "organized in his thinking, [sic] that he was conscious of every aspect of what he taught" (Foster, 1996, p. 45).

Some of the movements or actions that Rolland used to establish the violin posture are listed below:

1) Statue of Liberty—posture
2) Shuttle—shifting
3) Case walk—muscle development and posture
4) Left arm swing—string crossing and shifting. (Rolland, 1974, pp. 61-79).

Rolland uses simple folk songs and holiday tunes to implement his teaching method. The principles that he advocates could be applied to any repertoire. Some pieces by Stanley Fletcher were written especially for use in the

Rolland technique. An example is *Swinging Along*. This piece alternates major and minor thirds in order to help students establish placement of the second finger on the violin and viola. Fletcher composed two volumes of original compositions to be used to reinforce playing techniques that were being taught (Rolland,1970).

Rolland said that beginning violin students had a "native hand." When the fingers are placed on the string, they naturally fall on the following notes: first finger on the D string for the note E, second finger on the D string for $F^{\#}$, third finger on the A string for D, and fourth finger on the E string for B^{b} (Perkins, 1995). Rolland also states that all fingers should be introduced early in instruction so that students did not become "first finger specialists" (Perkins, 1995, p. 107).

Rolland identifies three types of movement with the left hand—vertical, horizontal, and across strings (Rolland, 1970, pp. 124-128). Vertical movement is the up and down movement of the finger. Horizontal is the movement between notes such as C to $C^{\#}$. He says that the swinging of the left elbow controlled movement across strings.

In Rolland's method book, *Prelude to String Playing* (1972), he uses several open string exercises in order to introduce the strings to the students. Following these exercises, a line for each note on the D string is practiced. The notes on the D string are D, E, F, $F^{\#}$, and G. After this introduction to the notes, two short melodies are introduced—Hot Cross Buns and the Cuckoo (Rolland, 1972, p. 8). These tunes involve the major third above the open string. A series of open string accompaniments for familiar tunes follow the introduction of the

fingers. The open string songs allow the students to perform and build basic skills that would be needed as more complex skills were introduced. This book also includes many exercises to help insure a tension-free approach to string playing.

Shinichi Suzuki

The work of Shinichi Suzuki has had a major impact on string teaching all over the world. Clifford Cook and John Kendall first introduced the Suzuki method of violin teaching in the United States in the late 1950's. The first performance of a Suzuki tour group of Japanese children was made in 1964 at a session sponsored by the American String Teachers Association at the Music Educators National Conference in Philadelphia. This history-making concert helped bring the Suzuki method to the attention of music educators from across the country (Kendall, 1996).

Suzuki's philosophy of string education encompasses the education of the entire individual. Suzuki referred to his method as "Talent Education." The Suzuki method combines a "philosophy, a pedagogical method, a concept of educational psychology, and an implicit social structure (the parent-child-teacher relationship)" (Kendall, 1996, p. 43). The method is based on a single concept called the "mother tongue" method. This means that any child capable of learning his or her own language is capable of learning music. Since music is a part of almost every aspect of every culture, music is an organizing force that has social impact on all people.

Suzuki states that his method has two principles that are most important: "The child must be helped to develop an ear for music" and "From the very beginning, every step must by all means be thoroughly mastered" (Suzuki, 1973, p. 12).

Students using the Suzuki method follow the same sequence of materials. The materials are designed in a sequence of advancing level of difficulty. Each of the pieces included in the repertoire focused on different skills to be developed (Suzuki, 1984). Review of the previous pieces in conjunction with the next more difficult selection allows the student to apply the newly acquired skills to the old pieces. By doing this, students and parents are able to see musical progress.

The development of the left hand involves musical selections. A "traditional finger pattern approach" is used in the repertoire presented in the initial songs in Volume 1. The pattern on the violin and viola involves a whole step between the first and second fingers and a half step between the second and third fingers (Fischbach, 1972, p. 12). On the violin, this pattern is taught on the A and E string using song repertoire. After the tunes are memorized, they are transposed to the G and D strings.

Ivan Galamian

Ivan Galamian was born in Persia, and he spent a large part of his life on the faculties of the Julliard School of Music and the Curtis Institute. His contributions to field of string pedagogy are primarily on violin playing, but many of the techniques that he used are applicable to other stringed instruments.

His philosophy of successful violin playing may be summarized by three factors:

> 1) The Physical Factor: consisting of (a) the anatomical make-up of the individual, in particular the shape of his fingers, hands, and arms, plus the flexibility of his muscular apparatus; (b) the physiological functioning with regard to the playing movements and the muscular actions that bring them about;
>
> 2) The Mental Factor: the ability of the mind to prepare, direct, and supervise the muscular activity;
>
> 3) The Aesthetic-emotional Factor: the capacity to understand and feel the meaning of the music, plus the innate talent to project its expressive message to the listener (Galamian, 1985, p. 3).

With the control of these factors, Galamian states that musicians are able to create superior performances.

Galamian also writes about the "vowels" and "consonants" of performance. He compares the vowels to the singing tone that has a "smooth beginning and a smooth ending" (Galamian, 1985, p. 10). The consonants are the articulations that can be created with the left hand or the right hand. With the bow hand, the consonants may be the *martelé*, *detaché*, or *spiccato* attacks. The left hand can produce the consonants with the percussive dropping or lifting of the fingers. According to Galamian, it is extremely important for the performer to have control of the proper articulation that is needed in a particular performance setting.

Galamian notes that the left hand is concerned with the fingering of notes and the vibrato. The posture of the body and left hand varies depending on the size of the player, and the most important feature is the absence of tension. Galamian discusses the use of modern fingerings that are superior to traditional fingerings. The modern violin chromatic fingering use fingers 1-2-3 or 1-2-3-4 in sequence before shifting. The traditional pattern is 1-2, 1-2. The new kind of fingering system is referred to as "creeping" (Galamian, 1985, pp. 32-33). Creeping uses the half-step shift with little or no movement of the thumb. This style of finger pattern allows for smoother phrasing in chromatic passages. The left hand can extend and contract into the new framework. "The hand follows [sic] the finger into the new position by a caterpillar-like crawling motion of adjustment" (Galamian, 1985, p. 34).

Most of Galmian's teaching is geared toward advanced players, but the ideas are applicable to any level of student studying a stringed instrument. His left hand shifting ideas are only a part of the legacy that he left to string teachers.

Kato Havas

Kato Havas was born in Hungary, and she began playing the violin at the age of five. By seven, she had given her first public recital, and at age seventeen, she made her Carnegie Hall debut (Havas, 1961). Her philosophy of violin playing is based on "an approach that eliminates physical disturbances and makes it possible for the mind to have full reign over the music" (Havas, 1961, p. 2).

Havas's method is based on balance. She sees this balance as an "elimination, through finding the exact balance, of all conscious muscular action, so that the mind can be freed from the impossible task of concentrating on two or more things at once" (Havas, 1961, p. 2).

When talking about the development of the left hand, Havas says that the left forearm should be suspended as straight as possible under the violin. She does not advocate a forward rotation of the elbow because of the tension that is created by such a motion. The neck of the violin falls into the space between the thumb and index finger. Because of this position, the thumb assumes a higher position (Havas, 1961).

When placing the left hand on the string, Havas says that the base knuckles should be tilted toward the scroll. The weight from the base knuckles is responsible for making the notes (Havas, 1961, p. 32). When considering shifting, Havas says, "just before shifting, the feeling of weight in the base knuckles is exaggerated" (p. 39). By exaggerating the weight prior to the shift, the hand springs to next position when the weight was released.

Samuel Applebaum

Samuel Applebaum studied with Leopold Auer at the Julliard School of Music, and in 1956, he joined the faculty of the Manhattan School of Music. He is known primarily for his numerous publications on string teaching.

Applebaum's main contribution to the field of string pedagogy is his materials for class instruction. His first method book was called *String Builder* (1960). This class method was published in three volumes. This method book introduces left hand technique through the major tetrachord on the D string: D, E, $F^{\#}$, G. Following two pages of D string practice, the pattern is transferred to the A string. The minor tetrachord, D, E, F, G, are introduced four pages later. These are the only finger patterns introduced in Book 1 of the *String Builder* (Applebaum, 1960).

In conjunction with the *String Builder*, Applebaum published a collection of tunes for string orchestra called *First Program for Strings* (1963). This book was designed to provide orchestra arrangements for the beginning level string class. The orchestra arrangements provided practice in the concepts and finger patterns that were used in the method book.

Another publication by Applebaum was the *Third and Fifth Position* (1963). This publication was designed to extend the technique of the string class beyond the first position. Applebaum's books could be used with a class or for individual instruction.

George Bornoff

The main contribution of George Bornoff to the area of string pedagogy is his publication *Finger Patterns* (1948). This publication is a beginning method for string players.

In this book, the first several pages are devoted to the practice of open string exercises in a variety of rhythms. One unique feature of the approach is the use of all four strings on each of the stringed instruments. A cycle beginning on the C string of the cello and viola progresses to the G, D, and A strings. The violin and the bass enter the cycle on the G-string and continue through their E strings. This process includes practice exercises on all four strings of each instrument

When introducing finger patterns, Bornoff begins with five-finger patterns. Beginning with the open string, each pattern is as follows (examples on the D string):

1) D E F G A

2) D E $F^{\#}$ G A

3) D E $F^{\#}$ $G^{\#}$ A

4) D E^{b} F G A

5) D E^{b} F G A^{b} (Bornoff, 1948, pp. 18-19).

These patterns are to be played on each of the strings on each of the instruments. After all patterns are introduced, the patterns are practiced in the rhythms that have been used when introducing the open strings. The remainder of the method book is devoted to the practice of the finger patterns using rhythmic variations and bowing variations.

Conclusions

Several influential pedagogues have written about the development of left hand technique. Some of the pedagogues have written technical exercises to be

used in teaching, and other have written treatises about left hand development. Many of the pedagogues wrote specifically about a particular stringed instrument, but many of the ideas can be applied to any of the stringed instruments. The exercises and materials developed by these pedagogues have influenced the materials that have been written for use in string classes in the schools.

INSTRUMENTAL MUSIC PROGRAMS AND METHOD BOOK DEVELOPMENT

It is important to understand the role of string classes in the public schools because these programs brought about a need for the development of materials. Once string classes appeared in the schools, materials were needed to meet the needs of the teachers. Before the inclusion of string classes in the schools, most of the materials used to teach instruments were specific to the instrument. No heterogeneous methods were available to the teachers, and because of this need, materials began to be developed.

Historical Perspective

Some of the first instrumental programs in the United States were after-school rehearsals with students who already played an instrument. The interest in these programs was attributed to the return of musicians to their communities following the decommissioning of Civil War bands. These musicians wanted to continue performing music, and they became the conductors of these groups (Birge, 1928). One of the first school orchestras to be founded was in 1878 in Aurora, Illinois, under the direction of B.W. Merrill. Other orchestras that were

founded before the turn of the century were in Wichita, Kansas (1896) under the direction of Jessie Clark, in Richmond, Indiana (1898) by Will Earhart, and in Indianapolis, Indiana (1898) by Charles E. Emmerich. Each of these orchestras was associated with high schools. Charles B. Jennings founded the first grammar school orchestra in 1896 in New London, Connecticut, and in 1899, W.D. Monnier founded a grammar school orchestra in Hartford, Connecticut (Birge, 1928, p. 166). These early orchestras did not seek to teach instrumental technique, but they used students who already played or took private instruction. Instrumentation of these groups was not balanced due to the lack of viola, cello, and bass players.

The next significant development in the school orchestra movement occurred in 1911 in Boston. Albert Mitchell, supervisor of music, began teaching violin classes following his study of the Maidstone movement in England. The Murdoch Music Company originated the Maidstone movement in 1898. For a small fee, this music company provided rental instruments, music, and teachers to thousands of students. Violin classes were held under the supervision of the schools (Hoisington, 1980). In 1912, Mitchell published his *Class Method*. Two years later, in 1914, violin classes were offered during the school day as a part of the elective curriculum in Boston (Norman, 1939). These violin classes were considered to be the first inclusion of instrumental string classes as a part of the regular school day.

In Los Angeles in 1903, Jennie Jones, a Kindergarten teacher, organized a before and after school orchestra program at Grant Avenue Elementary School. This program was emulated around Los Angeles, and by 1909, there were thirty such programs. Los Angeles was considered to be the first school district with an Orchestra Department in the Elementary Schools, which was established in 1910. By 1931, there were over 227 orchestras and more than four thousand student participants (Baxter, 1960).

With the inclusion of class teaching into the school day, a variety of publications began to be written to meet the needs of instruction. Some of the first books were Mitchell's *Class Method* (1912), and Maddy and Giddings' *Universal Teacher* (1926). These methods were some of the earliest editions for instruction of heterogeneous class groupings.

Another pioneer method book was Herfurth's *A Tune a Day* (1927). Each lesson in the book is designed to teach and practice a new skill. A tune is included in each lesson to reinforce the skill being studied.

The first five lessons of the book are open string exercises. These exercises may be accompanied by the teacher playing a line that includes the melody. Left hand skills are introduced by adding one finger at a time to the A and D strings. Lesson 7 adds the first finger on each string. Lesson 8 adds the major third above the open A and D strings, and lesson 9 adds the perfect fourth

above the open strings. The entire book uses he major tetrachord finger pattern on all four strings of each instrument.

The development of string method books grew out of a need for teachers to have instructional materials for group string teaching. Each of the books suited particular needs at the time of publication. There is little evidence to show that research was conducted on the effectiveness of any particular method books.

Teacher Training Method Books

Several method books were developed to be used in string teacher training. Kuhn (1967), Lamb (1971), Edwards (1985), and Klotman (1988) authored some of the most frequently used books. Each provided information about how left hand skills should be introduced to beginning string students.

Kuhn (1967) devoted one chapter of his method book to teaching finger patterns. Kuhn stated that fingers must remain close to the string, and fingers must stay down. These two points guided early instruction on the instruments. Kuhn used four finger patterns on all four strings. These patterns on the D string were as follows: 1) D E $F^{\#}$ G A; 2) D E F G A; 3) D E^{b} F G A^{b}; and 4) D E $F^{\#}$ $G^{\#}$ A. Each pattern was transferred from the D string to all other strings.

Lamb's (1971) *Guide to Teaching Strings* was designed for the college string methods course. The book provides practical information for the string teacher. No specific information about the appropriate order in which to teach finger patterns is included, but the book is an important reference work for string

teachers because of the many topics included. The book is divided into 4 sections. Section one provides an introduction to the instrument, bow, strings, and care and maintenance. Section two discusses techniques used on all four stringed instruments. Section three discusses approaches to teaching each individual stringed instrument. Section four discusses recent development in string teaching and the school string program.

Edwards (1985) began instruction with open string exercises. When fingers were added, he followed the same sequence as Kuhn (1967). In the practice exercises in the Edwards book, he used tunes from Western art music as teaching devices, and little folk song material was included.

Klotman (1988) wrote, "Materials that utilize only one key or finger pattern for extended periods of time create false concepts" (p. 62). Klotman used a series of five-finger patterns that began with open strings. Fingers were added, and he applied solfege syllables to describe the patterns. The patterns were as follows: 1) *do re mi fa sol la;* 2) *la ti do re mi fa*; 3) *mi fa sol la ti*; 4) *ti do re mi fa*; and 5) *fa sol la ti do*. It was intended that by using these patterns, students would learn several configurations of finger patterns.

METHOD BOOK RESEARCH

A review of method book research is included because it provides information about the books and materials that have been studied. Although little

method book research has been completed, the following section describes some of the studies that have been done.

Kantorski (1995) analyzed dissertations that were completed in the area of string education between 1936 and 1992. He found that less than nine percent of all dissertations in the area of string education focused on methods. The largest number of these string education dissertations was from the 1970's. Comprising almost fifty percent of all string education dissertations, the most often researched topics were performance practice and technique.

Kreuger (1990) evaluated the folk song material found in American string method books published between 1933 and 1980. Method books were reviewed using eighteen criteria developed from four independent lists written by Branning (1950), Trzcinski (1953), Kuhn (1957), and Wentworth (1977). Based on the evaluation of the method books, Kreuger wrote a beginning string method based on Brazilian folk songs.

Johnson (1994) completed a review of string method books that were in print at that time by American publishers. The review was completed in two parts. The first part was a page-by-page analysis of each book and the second part was organized by content. Johnson examined the following skill areas in each book: introductory information, note reading skills, right and left hand techniques, finger patterns, rhythm, pedagogical aspects of playing, tuning, scales, editing,

and support aids for the teacher. After analyzing each method, comments were made about the optimal use of each book.

Jeung (1999) reviewed twenty-four method books that were published between 1934 and 1994. Many of these books have been standard texts used in group string classes. The review contained the level of the book, key centers included, starting strings, starting note values, illustrations and pictures, structure and comments. Each of these items was described in a few words or sentences. Beginner and some more advanced literature were reviewed.

Wasson (2000) completed a review of seven string method books published between 1936 and 1995. The books were chosen because they were some of the earliest string method books available, were widely adopted, or were the more recent and available publications. The analysis of each book included finger patterns, note values, meter signatures, key signatures, scales, and other concepts. It was observed that none of the books included shifting during the early stages of instruction. Wasson noted the number of concepts included in the early books in comparison to more recent publications. For example, the *Primer Method* (Applebaum, 1936) included ten different scales, and *Essential Elements* (Allen, Gillespie, & Hayes, 1995) included only three. Table 1 presents a detailed analysis of these method books (Wasson, 2000).

Table 1

Concepts in Method Books Reviewed Listed by Page Number (Wasson, 2000)

	Applebaum *Primer Method* 1936	Lewis *Method For Violin* 1938	Cremin *Graded Violin Method* N.D.	Applebaum *String Builder* 1960	Muller & Rusch *String Method* 1961	Anderson & Frost *All for Strings* 1985	Allen, Gillespie, & Hayes *Essential Elements* 1995
Total Number of Pages	29	64	35	32	32	48	48
Finger Patterns							
Major Tetrachord	13	14		11	4	11	6
Minor Tetrachord	3	46	7	20	19	39	32
Lowered First Finger	15	50	11				
Extended Third Finger		52					
Fourth Finger	7	35	15		26		24
Lowered Fourth Finger	15						
Note/Rest Values							
Whole	3	13	7	6	26	27	39
Half	6	10	7	5	2	14	24
Quarter	8	10	10	3	2	14	4
Eighth	18	44	27	30	30	36	22
Sixteenth	26		32				
Dotted Half		11	15	17	22	28	27
Dotted Quarter	20	55	28				
Meter Signatures							
4/4	3	10	7	3	2	14	5
3/4	12	10	15	21	22	28	28
2/4	13	10			15	31	23
6/4			22				
6/8	24		30				
3/8	24						
Key Signatures							
G Major	18	32			17	33	26
D Major	25	28			14	13	14
C Major	3	50			20	39	38
F Major	20						
A Major		36					
B^b Major	27						
Scales							
C Major	21	50	35	29	20	45	38
G Major	18	32	24	21	17	33	27
D Major	25	25		21	14	25	11
A Major		36					
F Major	20		35				
B^b Major	27						
A Minor	21						
D Minor	24						
G Minor	28						
E Minor	23						
B Minor	26						
Other Concepts							
Dynamics	19			25			42
Up-Beat	16	43	17	21	18	28	30
Slur 2 Notes	15	38	9	17	15	30	29
Slur 3 Notes	17	39	33	21	23	31	33
Slur 4 Notes		42	27				
Slur Across Strings	15	40			15	30	29
Ties		12			15	31	27
Lift Bow		23			9	20	17
Left Hand Pizzicato				26	26		24

All of these method books began instruction using open string practice. In all but one of the method books described in Table 1, fingers were added one at the time beginning with the index finger. However, the *Essential Elements* (Allen, Gillespie, & Hayes, 1995) began with fingers on the string. For the violin, three fingers were added to the D string for the note G. The idea for this presentation was to build the proper hand shape from the beginning of instruction.

Johnson adapted the ideas of Paul Rolland in her book, *Young Strings in Action* (Johnson, 1985). This book used fingers on the string from the beginning of instruction. Johnson wrote, "Immediate use of the third finger will result in good left hand position and intonation" (p. 48). The same principle was applied to the cello and bass using fourth finger. Paul Rolland also advocated the use of many rote exercises until the student achieved proper posture. The first scale taught was the D major scale. Following this scale, students learned a song to go with the key. After learning this scale, the finger patterns were transferred to a new string, and another scale was learned. The song was transferred to the new string as well. Much of the early instruction was taught through rote activities. In Rolland's teaching, he placed emphasis on the teaching of basic concepts instead of the teaching of notes (Liu, 1990). This was done to foster students' understanding of how to play the instrument and not just individual pieces of music.

Dabczynksi, Meyer, and Phillips (2002) wrote a beginning string method called *String Explorer*. This book begins with the open string and adds fingers. The first tunes used in the book involve three notes. The major tetrachord on the D and A string are the first notes that are taught. The keys of D, G, C, and F are taught within volume one of this book

Frost and Fischbach (2002) wrote a beginning string method called *Artistry in Strings.* This book begins with open string exercises that are designed to build technique. When fingers are added to the string, the fingered G on the D string is the first introduced. This is done in order to build the shape of the left hand. The notes F and $F^{\#}$ are introduced next. The keys of D, G, and C are taught in this book.

In 1990, Slowik published an article that described ways to teach fingerboard geography. This approach to fingerboard geography was called "Pick 4." In describing the procedure, he described four areas of fingerboard knowledge:

> 1) A firm mental grasp of what notes are played in each position.
> 2) A firm mental grasp of what whole and half-step combinations are created in each position in various keys.
> 3) A clearly established feeling for each position located on the viola (a feeling of establishing a home base or hand frame within which fingers can move).
> 4) The ability to pre-set the fingers of the hand into the proper whole-step and half-step alignment whenever the hand is moved (either to a new string or new position). (Slowik, 1990, p. 58)

Slowik also described the four most common hand shapes in any one position: "1) Half-step between 1st and 2nd fingers (the rest whole steps), 2) Half-steps between 2nd and 3rd fingers (the rest whole steps), 3) Half-step between 3rd and 4th (the rest whole steps), and 4) All four fingers separated by whole steps" (p. 59). With this system of finger patterns, the violist may perform the pattern on all four strings in any one position. Student may also perform patterns between strings using a particular key center to determine the shape of the hand. In addition to these two uses, the student may shift between positions creating new patterns.

The pick 4 method of fingerboard geography is very useful to violin and viola players. However, it would be difficult to use in the heterogeneous string class due to the exclusion of material for cello and bass students. Once a cello or bass student moves beyond first position, a shift is required in order to play all of the notes of a scale.

Dick and Scott (2000) developed a method of fingerboard logic that utilizes "elevators" and "escalators." This approach to teaching fingerboard geography uses a sequential pattern of notes on one string or a combination of all four strings. This approach to the fingerboard is suitable for use with heterogeneous string classes.

An escalator begins with a whole step followed by three half steps. The escalator may begin with an open string or a finger in place. The three different

escalators in the first position give the string player practice in chromatic alterations that are found in that position. A more detailed description of escalators may be found in Chapter Three.

Elevators are finger patterns that occur between all strings. There are four different elevators (detailed description of these may be found in Chapter Three). The elevators assist string players with making connections between strings. Through the use of elevators, students are able to learn adjacent notes in any given position. The elevators may be moved from position to position making this approach comprehensive in presentation of the entire scope of the string fingerboard.

Dick and Scott's approach to the fingerboard is important because it takes complex information and presents it into small steps that are more easily mastered. In addition, the elevators and escalators can be moved to other positions on the instrument. This enables a complete understanding of the string fingerboard. With a thorough understanding of the fingerboard, students can make independent decisions regarding fingering and positions that may be used to optimally perform a new piece of music.

CONCLUSIONS

The development of method books grew out of a need for heterogeneous class instruction. Most method books contain materials that the author(s) believed

was important for beginning string students. Only a few research studies involved the testing of any of these materials.

Research into the methods being used when instructing heterogeneous classes is needed. Such study may provide information about methods that are apparently successful. The elevator and escalator approach described above (Dick & Scott, 2000) has been studied only through informal observation by the originators and others familiar with that approach. No formal study has been completed. It is the purpose of this study to provide data about the effectiveness of the elevator and escalator approach to teaching fingerboard geography to beginning string students.

Chapter 3: METHOD

The ability to navigate the fingerboard in a systematic fashion is an important skill for any string player. If a student is able to perform musical passages in one position without unnecessary shifts, the likelihood for error is reduced. Understanding relationships between notes on the fingerboard is an essential part of navigation on the strings. The use of elevators and escalators may enhance this ability due to the relationships between strings that students learn.

MAIN STUDY

Design

The experimental design of this study consisted of a pretest and posttest with three treatment groups: video instruction, worksheet instruction, and a control group. Three intact classes were used in this study. Prior to the treatment, a pretest was given in order to determine whether there were differences between the groups' note naming abilities and performance abilities. The investigator designed the pretests and posttests.

One experimental condition involved researcher-prepared video instruction using elevators and escalators. The second experimental condition consisted of elevator and escalator instruction using researcher-prepared worksheets. The control group used a method book approach. Selected sections from the method book were used in order to practice the same concept that was being practiced by the elevator and escalator groups. Lessons occurred every day

during a six-week instructional period. The elevator and escalator lessons were designed to be a 10 to 15 minute segment of the normal 50 minute class.

Participants

Participants (*N*=57) for this project involved two intact classes at Lamar Middle School and one intact class at Small Middle School in Austin, Texas. Students at Lamar Middle School received the elevator and escalator treatments, because this was a part of the curriculum that the regular teacher was planning to implement before being requested to participate in this research. The pretest was a researcher-designed test that was administered in two parts—note reading and performance. A copy of the pretest may be seen in Appendix B. The note-reading portion of the pretest consisted of 20 notes on the staff. The students were asked to give the letter name of the note and how it would be performed on their instrument. For example, open D would be described as D 0. This meant that the note would be played on the D string with no fingers on the string. For the performance test, the students were given 4 lines of music with 4 notes on each line. Students were asked to verbally name the notes. After naming the notes, students played the notes on their instruments. Students at Lamar middle school served as the experimental groups, and students at Small Middle School served as the control group. The elevator/escalator approach was not a part of the curriculum at that school.

The two elevator/escalator treatment groups were from the Lamar Middle School. Participants in Group 1 (*N*=17) (the elevator/escalator video instruction) were from three ethnic groups—African-American (*n*=2), Hispanic (*n*=7), and white (*n*=8). Group 2 (*N*=19) (the elevator/escalator worksheet practice) participants were African-American (*n*=2), Hispanic (*n*=5), and white (*n*=12). Participants in Group 3 (N=21) were from Small Middle School. The ethnic makeup in the control group was as follows: African-American (*n*=1), Asian (*n*=2), Hispanic (*n*=5), and white (*n*=13). These data are shown in Table 2.

Table 2

Information of the Treatment Groups

	African-American	Asian	Hispanic	White	Total
Group 1	2	0	7	8	17
Group 2	2	0	5	12	19
Group 3	1	2	5	13	21

All students were sixth graders enrolled in beginning string class. All students began playing their instruments at the beginning of the school year, and they received instruction for 50 minutes every school day. The study was begun in the 7th week of the second semester and continued through the 13th week.

Treatments

This project was divided into two treatment phases. Phase one lasted approximately three weeks, and it focused on the introduction and practice of the escalator patterns. This instruction began on February 19 and continued until March 9, 2001. The second phase of the treatment involved the introduction and practice of the elevators. This instruction began on March 20 and continued through April 13, 2001. A one-week district-wide Spring Break occurred between the two treatment phases.

The string teacher of each school did all live instruction. Group 1 received the elevator and escalator instruction with a videotape presentation. A video showing each elevator and escalator was created. A detailed description of the elevators and escalators may be found later in this chapter.

Group 2 received the elevator and escalator instruction using printed materials. A copy of the elevator worksheets may be seen in Appendix C, and the escalator worksheets may be seen in Appendix D. The worksheets contained printed versions of the elevators and escalators. A worksheet was created for each of the elevators and escalators. The worksheet had the notes with numbers under the notation that gave the students the finger number that would be used to perform the note. Also, when the same finger played two consecutive notes, the word “slide” was used to instruct the student in the movement of the finger.

Group 3 received instruction from the *All for Strings, Volumes 1 and 2* (Anderson & Frost, 1985 & 1986) method books. Selected lines were chosen from the books that practiced the same concept being studied by the worksheet and video groups. During the time span of the study, all three groups covered the same basic concepts of chromatic fingering. The groups and the treatments may be seen in Table 3.

Table 3

Treatment Groups Used in the Study

Group 1 (*N*=17)	Teacher instruction using elevator/escalator videos
Group 2 (*N*=19)	Teacher instruction using elevator/escalator printed materials (worksheets)
Group 3 (*N*=21)	Teacher instruction using method book materials

The researcher developed lesson plans for each session. The intent of the lesson plans was to be the technique portion of the lesson being delivered by the teachers. The lessons were approximately 10 to 15 minutes in duration, and they were inserted into the regular lesson that the teacher had planned for each day. The lesson plans were made up of an introduction to the concept and a practice

activity. Two day sample lesson plans for each group may be seen in Tables 4, 5, and 6. A complete listing of lesson plans may be found in Appendix A.

Table 4

Video Group Two Day Lesson Plan Example

Lesson One

Escalator: an escalator is "a moving staircase working on the principle of an endless chain" (Cayne, 1993, p. 321) When applying this principle to string playing, an escalator is movement from one note to the next on one string or the next adjacent string.

The escalators to be studied involve the following melodic pattern: whole step, half-step, half-step, half-step. The escalator covers the interval of a perfect fourth.

I. Teacher will define escalator
II. Students will watch the open escalator video
III. Students will name the notes of the open escalator: D E F $F^{\#}$G
IV. Students will play the notes of the open escalator on the D string

Lesson Two

Day two will begin with a review of the open escalator.

I. Students will watch the open escalator video.
II. Students will play the open escalator on the D string
III. Students will name the notes of the open escalator on the A string (A B C $C^{\#}$ D)
IV. Students will perform the open escalator on the A string

Table 5

Worksheet Group Two Day Lesson Plan Example

Lesson One

Terms used in this lesson:

Escalator: an escalator is "a moving staircase working on the principle of an endless chain" (Cayne, 1993, p. 321) When applying this principle to string playing, an escalator is movement from one note to the next on one string or the next adjacent string.

The escalators to be studied involve the following melodic pattern: whole step, half-step, half-step, half-step. The escalator covers the interval of a perfect fourth.

I. Teacher will define escalator
II. Students will name the notes of the open escalator: D E F F# G
III. Students will play the notes of the open escalator on the D string

Lesson Two

Day two will begin with a review of the open escalator

I. Students will play the open escalator on the D string
II. Students will name the notes of the open escalator on the A string (A B C C# D)
III. Students will perform the open escalator on the A string

Table 6

Control Group Two Day Lesson Plan Example

Lesson One

Students will practice the half step finger placement between F and $F^{\#}$ on the D string.

I. Students will name the notes of *All for Strings Volume 1*, Line 146
II. Students will play the notes of Line 146

Lesson Two

Students will practice half step finger placement between C and $C^{\#}$ on the A string.

I. Students will name the notes of *All for Strings Volume 1*, Line 161
II. Students will perform the notes of Line 161

Treatment Group 2 used worksheet materials to cover the identical material as Group 1. Instead of receiving the video introduction, students named the notes of the appropriate escalator presented in worksheet form, and they performed them on their instruments. The Control group also studied the same group of notes, but their instruction involved selected lines from Volumes One and Two of *All for Strings* (1985 & 1986). Practice lines in the method books were selected that covered the same concepts as the two treatment groups. The only difference was the mode of presentation and practice of the concept.

Elevators and Escalators

The starting point to understanding finger patterns is the labeling of the fingers. Most instruction uses a numbering system. The index finger is referred to "one." The middle finger is "two." The ring finger is "three." The pinky finger is "four." This number system is used with all of the stringed instruments to be described in this research study.

Escalators were defined as a finger pattern involving consecutive notes on one string. The pattern may continue to the adjacent string if the pattern begins with a finger already on the string. Each escalator begins with a whole step, and it continues with three additional half steps. Table 7 gives a brief description of the notes involved in the escalators. On the violin and viola, the first escalator on the D string covers the notes D E F $F^{\#}$ G. In this pattern the second finger slides from the F to the $F^{\#}$. The second escalator begins with the first finger in place. This escalator on the D string is E $F^{\#}$ G $G^{\#}$ A. In this pattern, the third finger slides from G to $G^{\#}$. The final escalator on the D string begins with the second finger in place. This escalator is $F^{\#}$ $G^{\#}$ A $A^{\#}$ B. This escalator involves the sliding of the first finger from $A^{\#}$ to B. Through these three escalators, the student is able to practice the chromatic alterations in the first position on the violin and viola.

Table 7

Escalators with Finger Number Used for Each Note

Escalator 1					
	Violin/Viola	D	E	F	F#	G
		0	1	2 (slide)	2	3
	Cello	D	E	F	F#	G
		0	1	2	3	4
	Bass	D	E	F	F#	G
		0	1	2	4	1 (shift to 3rd position)
Escalator 2						
	Violin/Viola	E	F#	G	G#	A
		1	2	3 (slide)	3	4
	Cello	E	F#	G	G#	A
		1	2	3	4	1 (shift to 4th position)
	Bass	E	F#	G	G#	A
		1	4	0	1	1
Escalator 3						
	Violin/Viola	F#	G#	A	A#	B
		2	3	0	1 (slide)	1
	Cello	F#	G#	A	A#	B
		2	4	0	1	1
	Bass	F#	G#	A	A#	B
		4	1	1	2	4

Elevators assist students with the navigation of the fingerboard across strings. A detailed description of elevators may be seen in Table 8. The elevator involves finger patterns that occur between two or more strings. An open string

elevator on the violin is G D A E. The second elevator involves the open string and first finger on each string. This elevator is G A D E A B E $F^{\#}$. The next elevator involves the minor finger pattern on each string. This elevator is G A B^{b} D E F A B C E $F^{\#}$ G. The major elevator on the violin is G A B D E $F^{\#}$ A B $C^{\#}$ E $F^{\#}G^{\#}$. The major tetrachord elevator for the violin is G A B C D E $F^{\#}$ G A B $C^{\#}$ D E $F^{\#}$ $G^{\#}$A. Two additional elevators that were not a part of the current research may also be incorporated--minor second and whole tone. The minor second elevator is G A^{b} D E^{b} A B^{b} E F. The whole tone would be G A B $C^{\#}$ D E $F^{\#}$ $G^{\#}$ A B $C^{\#}$ $D^{\#}$ E $F^{\#}$ $G^{\#}A^{\#}$. Once each of these elevators is mastered, the student is able to play the entire chromatic scale in first position.

Table 8

Elevators between Strings

Elevator 1 (Open string and first finger)				
Violin	G A	D E	A B	E $F^{\#}$
Viola	C D	G A	D E	A B
Cello	C D	G A	D E	A B
Bass	E $F^{\#}$	A B	D E	G A
Elevator 2 (minor)				
Violin	G A B^{b}	D E F	A B C	E $F^{\#}$ G
Viola	C D E^{b}	G A B^{b}	D E F	A B C
Cello	C D E^{b}	G A B^{b}	D E F	A B C
Bass	E $F^{\#}$ G	A B C	D E F	G A B^{b}
Elevator 3 (major)				
Violin	G A B	D E $F^{\#}$	A B $C^{\#}$	E $F^{\#}$ $G^{\#}$
Viola	C D E	G A B	D E $F^{\#}$	A B $C^{\#}$
Cello	C D E	G A B	D E $F^{\#}$	A B $C^{\#}$
Bass	E $F^{\#}$ $G^{\#}$	A B $C^{\#}$	D E $F^{\#}$	G A B
Elevator 4 (major tetrachord)				
Violin	G A B C	D E $F^{\#}$ G	A B $C^{\#}$ D	E $F^{\#}$ $G^{\#}$ A
Viola	C D E F	G A B C	D E $F^{\#}$ G	A B $C^{\#}$ D
Cello	C D E F	G A B C	D E $F^{\#}$ G	A B $C^{\#}$ D
*Bass	E $F^{\#}$ $G^{\#}$ A	A B $C^{\#}$ D	D E $F^{\#}$ G	G A B C

Note: Bass must shift to third position for final note in each group

Video Creation

The videotapes used in this study were created using a Hewlett Packard 8760C personal computer with a 733-megahertz Pentium III processor. Videotaped performance segments were recorded using a Canon Optura Digital Video camera. This video was imported into the computer using an IEEE 1394 Firewire video capture board. Studio DV (2000) software was used to capture the video and to add text and sound. Sounds of the violin, viola, œllo and bass were recorded using a Labtec AM-242 microphone and Sound Recorder software that was included as a part of the Windows 98 Second Edition Operating System. Sounds were saved in the WAV format. The sounds were added to the captured video using the Studio DV (2000) program.

Videos were saved to Video format on the computer. The edited videos were then transferred back to the Canon Optura Digital Video camera via the IEEE 1394 Firewire cable. The digital videos were then transferred to VHS tape for use in the video instruction treatment.

Each video used in the study had duration of between 13 and 69 seconds. A total of twenty-five videos were produced. A list of the videos follows: open escalator; first finger escalator, second finger escalator, open/first finger elevator, minor elevator, major elevator; and major tetrachord elevator. These were

described in more detail in Table 7 and Table 8. Each of the videos and their respective durations are shown in Table 9.

Table 9

Video Types, Duration in Seconds, and Number of Notes Included

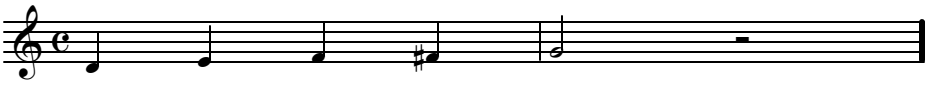
Video Type	Number of Seconds	Number of Notes
Open Escalator		
Violin/Viola	13	5
Cello	16	5
Bass	16	5
First Finger Escalator		
Violin/Viola	14	5
Cello	18	5
Bass	19	5
Second Finger Escalator		
Violin/Viola	22	5
Cello	19	5
Bass	20	5
Open/first finger Elevator		
Violin/Viola	24	8
Cello	47	8
Bass	35	8
Minor Elevator		
Violin/Viola	38	12
Cello	58	12
Bass	41	12
Major Elevator		
Violin/Viola	39	12
Cello	57	12
Bass	44	12
Major Tetrachord		
Violin/Viola	51	16
Cello	69	16
Bass	60	16

In addition to the videos for Group 1, I created worksheets that were based on the same instructional material for use with Group 2. These worksheets involved the presentation and practice of the elevator and escalator materials. The elevator and escalator patterns that were presented in the video format were translated into printed materials. A sample worksheet may be seen in Figure 3.

Violin D Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator

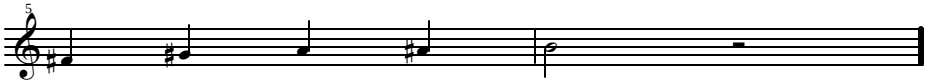


0 1 2 –slide—2 3

First Finger Escalator

1 2 3 --slide— 3 4

Second Finger Escalator



2 3 0 1 --slide- 1

Figure 3. D-String Escalator Worksheet for Violin

Worksheets were created for each of the instruments for each string. A separate worksheet for each string was created to show the notes of the escalators on each string. The elevator worksheets contained all four elevators on one sheet.

Copies of the escalator worksheets may be seen in Appendix C, and the elevator worksheets may be found in Appendix D.

During the experiment, the Control group studied the same finger patterns as the video and worksheet groups. The exercises were drawn from the *All for Strings Book I and II* (Anderson & Frost, 1985 & 1986) method book. Lines were selected that would match the concept being studied by the experimental groups. The same procedure of naming the notes before performing the exercise was used.

Testing

The students received a pretest prior to the start of the project. One purpose of this pretest was to measure the ability of the students to name notes and to perform patterns. A second purpose was to test whether the three groups were comparable in these two skills. The patterns performed by the students involved all of the notes in the first position on the four stringed instruments used in the study. The test was in two parts. The first part was a note-naming test that asked students to write the name of notes and how the notes would be played on the instrument. The second part of the test involved the student reading notes from the staff and performing the pattern on his/her instrument. The patterns used in this part of the test involved chromatic finger movement on one or more strings. The tests were designed to test the ability of the students to perform chromatic left-hand finger patterns. The students named the notes in the pattern and then performed the pattern on their instruments. This test was videotaped for

subsequent analysis. A copy of the pretest and posttest may be found in Appendix B.

Following the completion of the pretest, data were analyzed using descriptive and inferential statistics. Descriptive statistics were used to describe the results for individual items on the pretest. Groups were compared using the Kruskal-Wallis One-Way Analysis of Variance by Ranks to see if there were significant differences between groups at the beginning of the project.

Following the completion of the two three-week phases of instruction, a posttest was given. The posttest consisted of two parts. Part one was a pencil and paper test to name notes and finger patterns that had been covered during instruction. The second part was a performance measure that asked students to name the notes and to perform the patterns on their instruments to test the ability of the students to perform chromatic left-hand finger patterns. These patterns involved chromatic fingerings that allowed assessment of understanding of the fingerboard. The posttest was the same as the pretest except for the addition of two lines that tested the note naming and performance of two escalators. This test also was videotaped for later analysis.

ANCILLARY CASE STUDY

The purpose of the case study was to compare two advanced students who were trained using two different approaches. These students had attained

approximately the same performance ability level on the violin. The study detailed the training that each student received, and it compared the students' ability to apply fingerboard logic to a difficult piece of music.

Participants

Both participants in this study began playing the violin in sixth grade as students in the Austin (Texas) Independent School District. One participant attended O. Henry Middle School, and the other participant attended Porter Middle School.

As a part of the O. Henry Orchestra, Participant One studied the violin using the elevator and escalator approach. In addition to being in the school orchestra, the student also began taking private lessons in seventh grade with a private instructor who used elevators and escalators to teach fingerboard navigation. This type of teaching was included in addition to method books, etudes, and solo material. Throughout the student's school career, he was a part of the school orchestra. As a high school senior, the student was concertmaster of his orchestra. This participant has been a member of the region orchestra for five years, and he has been a participant in the All-State Orchestra for three years. The student was a member of the Austin Youth Orchestra through all four years of high school, and as a senior, he was co-concertmaster of this orchestra.

Participant Two had a similar musical background. He attended Porter Middle School. The teacher at this school used a method book approach in teaching beginning students. He also began taking private lessons in seventh grade. His private teachers used a traditional approach to teaching that included the use of method books, etudes, and solo repertoire. During high school, the participant had been a member of the region orchestra for all four years. He was a member of the All State Orchestra for two years, and he was also a member of the Austin Youth Orchestra during all four years of high school. As a senior, he was co-concertmaster of the Youth Orchestra with Participant one.

Design

A case study was completed in order to describe the musical development and approach to the fingerboard of two advanced high school students. The researcher conducted an interview to gain information about how each student was trained. Questions used in the interview may be seen in Appendix E. Prior to the interview, a new piece of music was introduced to the students. Students were given five minutes to prepare the piece. They were allowed to make notes on the music to assist with finger patterns. Following the five-minute practice period, the participants performed the music. The entire sight-reading process was videotaped. The videotape was analyzed to help determine the process that the

students used to learn the music. The tape was analyzed also to determine the finger patterns that were used to perform the musical selection.

Musical Selection

Hans Sitt composed the musical selection used in the case study. The selection was the first seventeen measures of etude number sixty-nine from *One Hundred Studies, Op. 32* (1928). This etude was designed to be played in seventh position on the violin. This etude was chosen because it is unknown to most young string players and because it was composed to develop the ability to play extended passages of music in one position. All fingerings were removed in order to eliminate any clues as to how the selection should be performed. Additionally, the music was transposed from the key of A^b major to A major. The key of A allowed the students to have open strings in order to check intonation during the practice period. The key was also changed in order to further ensure that the students had not had prior experience with this piece of music. A copy of the musical selection used for this portion of the study may be seen in Appendix F.

Testing

Data collected during the case study were in three different formats: videotape of the sight-reading session, an audiotape of the interview, and the printed music used during sight-reading.

The five-minute preparation period was videotaped, and it was analyzed using SCRIBE (Duke & Farra, 1995). Data were collected using the following timed events: playing, writing, fingering, and looking. A count of the number of times that the participant stopped and restarted was also collected.

The performance of the musical excerpt also was analyzed using SCRIBE (1995). A count of the number of shifts was made using the marker feature of the program. The tempo chosen was also reported.

The markings made by each of the participants on the sheet music gave the researcher information about the positions that the participant planned to use in performance. Also, a count of the number of marks was made.

A transcript of the audio taped interview was created. The comments gave general background information about the participants. Comments from the interviews gave the researcher information about how the participants were trained and how they approached the choice of positions on the fingerboard.

RELIABILITY

Reliability was assessed on the pretest and posttest using a second independent observer, who is an experienced string teacher. For the written test, the second observer viewed twenty percent of the tests. An analysis of twenty percent of the written test items was completed in order to test for agreement between the researcher and observer in grading the written items. Reliability was

calculated by dividing the number of items agreed upon by the total number of items graded.

For the videotaped tests, the second observer watched and scored approximately twenty percent of the tapes. The observer scored whether the student performed the correct finger pattern or not. The inter-observer reliability was calculated by dividing the number of agreements by the total number of items viewed.

Chapter 4: RESULTS

Performers of stringed instruments must have a thorough understanding of fingerings and positions on all four strings in order to navigate the fingerboard. In order to teach fingerboard geography, teachers rely on familiar methods for delivering this information. These methods usually include method books and rote instruction.

One purpose of this study was to provide information about beneficial ways for teachers to instruct students about fingerboard geography. Very little information on this topic has been written. Most of the research studies about methods and method books are designed to describe the information and the format in which it is delivered (Jeung, 1999; Johnson, 1994; Krueger, 1990; Wasson, 2000).

The focus of this project was to investigate the effects of an innovative teaching approach on students' ability to navigate the fingerboard. Dick and Scott (2000) developed the ideas that were studied in this project. The approach for teaching fingerboard geography is called "elevators and escalators." The effectiveness of this approach has been noted through informal observation of students of these two teachers.

ANALYSIS OF DATA

For the present research, I decided to use nonparametric statistics for data analysis: a) The sample sizes in the groups were relatively small, b) Pretests and posttests were designed specifically for this research by the experimenter, and c) The students' abilities in each of the three groups were heterogeneous. The Krusal-Wallis Analysis of Variance was used to analyze the data. Although rank-ordered scores of raw data were used in the analyses, mean scores are shown in the tables because raw and mean scores are more easily understood.

RELIABILITY

Reliability was assessed on the pretest and posttest using a second independent observer who is an experienced string teacher. For the written test, the observer viewed 20% of the tests. An analysis of these tests was completed in order to assess agreement between the researcher and observer in grading the written items. Reliability was calculated by dividing the agreed upon items (811) by the 820 items graded. Reliability was 98.9% for written tests.

For the videotaped tests, the second observer watched and scored 20% of the tapes. The independent observers determined whether the student performed the correct series of pitches. The reliability was calculated by dividing the number of agreements by the total number of items viewed. A total of 168 items were graded, and there was agreement on 142 items for an interobserver reliability of 84.5%.

PRETEST RESULTS

The students received a pretest prior to the start of the project. The test was in two parts. The first part was a written general music-reading test that asked students to name the notes from the staff and describe how it would be played. The second part of the pretest was a performance test. This portion of the pretest involved four patterns that tested students' ability to perform chromatic string patterns on one string and between strings. The students named the notes in the pattern and then performed the pattern on his/her instrument. This test was videotaped for subsequent analysis and reliability. A copy of the pretest may be found in Appendix B.

Pretest-General Music Reading Test

The first part of the pretest was a written test. This part of the pretest was designed to test students' ability to name the notes on the staff and to designate the appropriate finger to use when performing the note. The test consisted of 20 items. For each item on the pretest, the student was asked to make two responses, naming and fingering. A total of 40 points was possible. Tests scores reflected the number of items that were answered correctly. Two of the groups were from Lamar Middle School, and the third group was from Small Middle School. The mean number correct for each group was as follows: (Lamar) Group 1=25.94,

(Lamar) Group 2=31.58, and (Small) Group 3=29.52. These data may be seen in Table 10.

The music reading pretest raw data were analyzed using the Kruskal-Wallis Analysis of Variance by Ranks. Although the following tables show the mean score for each group, rank-orders of the raw scores were analyzed. An alpha value of .05 was selected as the significance level for rejection of the null hypothesis throughout the study. As seen in Table 10, the hypothesis of no difference between the three groups on the music reading pretest was not rejected, H (2, N=57)=4.48, p >.05. Thus, there was no significant difference between groups in the ability to name the notes on the pretest.

Table 10

General Music-Reading Pretest Descriptive Statistics and Statistical Analysis

	Mean	Range	*SD*
Group 1	25.94	13 – 40	8.16
Group 2	31.58	17-40	8.16
Group 3	29.52	11-40	9.06
Kruskal-Wallis	H (2, N=57)=4.48	p >.05	

Pretest-Performance Test

The performance portion of the pretest contained four lines of music. Students were asked to say the names of notes. Following naming the notes, the students performed the pattern on their instruments. The number of items that were performed incorrectly was computed. Lamar Group 1 had a mean of 3.41 items (out of 16) incorrectly with a standard deviation of 2.53. Lamar Group 2 had a mean of 2.63 with a standard deviation of 2.65, and Small Group 3 had a mean of 4.14 incorrect with a standard deviation of 3.17. As seen in Table 11, the hypothesis of no difference between the three groups on the performance pretest was not rejected, H (2, N=57)=2.00, p >.05. Thus, there was no significant difference between the groups in the number of incorrectly performed notes on the pretest.

Table 11

Number of Items Incorrect on Performance Pretest and Statistical Analysis

	Items Incorrect Mean Number	*SD*
Group 1	3.41	2.53
Group 2	2.63	2.65
Group 3	4.14	3.17
Kruskal-Wallis	H (2, N=57)=2.0	p>.05

POSTTEST RESULTS

Following a six-week treatment period, a posttest was given. A copy of the posttest may be seen in Appendix B. The posttest consisted of a written general music reading test and a performance test. Group 1 received the elevator/escalator video instruction. Group 2 received the elevator/escalator worksheet instruction, and Group 3 was the control group that received traditional method book instruction with no exposure to the escalator/elevator approach to finger patterns.

Posttest-General Music Reading Test

The first research question asked:

> Are there differences between students who receive traditional method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on written tests of note naming and finger placement?

The posttest was designed to test students' ability (1) to name the notes on the staff and (2) to designate the appropriate finger to use when performing the note. The test consisted of 20 notes. For each note, the student was requested to make two responses. The total possible points were 40. Test scores reflected the number of items that were answered correctly. The mean of each group was as follows: Group 1=29.82, Group 2=34.63, and Group 3=30.48. As seen in Table 12, the hypothesis of no difference between the three groups on the written music reading posttest was not rejected, H (2, N=57)=4.97, p >.05.

Table 12

General Music-Reading Posttest Mean and Statistical Analysis

	Mean	Range	*SD*
Group 1 (Video)	29.82	17 – 40	8.02
Group 2 (Worksheet)	34.63	14 – 40	7.90
Group 3 (Control)	30.48	4 – 40	9.17
Kruskal-Wallis	H (2, N=57)=4.97		p >.05

Posttest-Performance Test

Following the written portion of the pretest, a performance test was given. This test sought to answer the following question:

> Are there differences between students who receive traditional method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on performance tests incorporating chromatic finger patterns?

The number of items that were performed incorrectly was computed. Group 1 performed a mean of 2.88 items (out of 16) incorrectly with a standard deviation of 2.06. Group 2 had an average of 1.21 with a standard deviation of 1.72, and Group 3 had an average of 3.38 incorrect items with a standard

deviation of 3.17. As seen in Table 13, the hypothesis of no difference between the three groups on the performance posttest was not rejected, H (2, N=57)=5.96, p >.05. Thus, there was no significant difference between the groups in the ability to correctly perform the notes on the posttest.

Table 13

Items Incorrect on Performance Posttest and Statistical Analysis

	Items Incorrect Mean Number	*SD*
Group 1 (V)	2.88	2.06
Group 2 (W)	1.21	1.72
Group 3 (C)	3.38	3.17
Kruskal-Wallis	H (2, N=57)=5.96	p >.05

The difference in the number of incorrect items between the pretest and posttest was compared for each group. Group 1 had a decrease of .53 items incorrect. Group 2 had 1.42 fewer items incorrect, and Group 3 had a decrease of .75 incorrect items. As seen in Table 14, the hypothesis of no difference between the three groups on the difference between the performance pretest and posttest was not rejected, H (2, N=57)=1.46, p >.05.

Table 14

Mean Number of Items Incorrect for the Pretest and Posttest Performance Test, Difference between the Two Tests, and Statistical Analysis

	Pretest Incorrect items	Posttest Incorrect Items	Difference
Group 1 (V)	3.41	2.88	.53
Group 2 (W)	2.63	1.21	1.42
Group 3 (C)	4.14	3.38	.76
Kruskal-Wallis		H (2, N=57)=1.46	p=>.05

Two additional lines of music were included on the posttests that were not a part of the pretest. These lines were escalators. The lines were intended to test the ability of the students to perform chromatic finger patterns on one string. Group 1 had a mean error rate of .17 out of a possible 10 notes. Group 2 had a mean error rate of .05, and the control group had a mean error rate of 1.71. A significant difference in the groups' ability to perform the escalators was found. As seen in Table 15, the hypothesis of no difference between the three groups on the ability to perform escalators was rejected, H (2, N=57)=11.94, p < .05. Further testing was done in order to see which groups were significantly different from one another. Using the mean rank of each group, the Dunn's procedure was completed and revealed that the error rate for Group 3 (M=1.71) was significantly

higher than for Group 2. There was no difference between Groups 1 and 2, and Groups 1 and 3.

Table 15

Mean Number of Items Incorrect for Escalator Lines Included on Posttest and Statistical Analysis

	Mean items incorrect	*SD*	
Group 1 (V)	.18	1.25	
Group 2 (W)	.05	0.46	
Group 3 (C)	1.71	2.05	
Kruskal-Wallis	H (2, N=57)=11.94	p <.05	
Dunn's Procedure (mean rank scores)		29.7	19.2 37.3

Note: Underline indicates a significant difference (p < .05) between means.

ANCILLARY CASE STUDY RESULTS

The case study involved two advanced high school violinists who had studied using two different pedagogical approaches to the violin. Information about their background was collected using a structured interview. Questions for the interview may be seen in Appendix E.

The research question for this aspect of the study was as follows:

Does an advanced high school student who has been trained using the elevator and escalator approach to the fingerboard make different fingering choices than an advanced high school student trained using a method book approach when sight-reading a new selection of music? Do the students use different finger patterns when approaching the new musical selection and demonstrate knowledge of the relationship of notes across the strings?

Participant One

Participant One began playing the violin in the sixth grade at O. Henry Middle School. His training began with William Dick, who used the elevator and escalator approach to fingerboard geography. Students enrolled at this middle school progressed through beginning violin class with a series of masteries. These masteries guided the violin instruction during each grading period. Students were required to complete a minimum of six masteries during each grading period. During the three years of instruction at the school, a total of 144 masteries were required (Dick & Scott, 2000).

The participant began taking private lessons during the seventh grade. From that point in time, the student remained with the same instructional approach throughout middle and high school. The instruction reinforced the elevator and escalator approach that was being used at school. At the time of the

project, the student was a high school senior and was studying several advanced level solo works by Wieniawski, Copland, Brahms, Mozart, and Lalo. The student had also been selected as outstanding soloist for the Austin Independent School District Solo and Ensemble Competition. During the participant's time in the area orchestras, he was a member of the Region Orchestra five times. He was also a part of the Texas All State Orchestra on three occasions. As a senior, the student was co-concertmaster of the Austin Youth Orchestra.

When asked about how he was taught to navigate the fingerboard, the participant said that he was usually given fingerings, but he relied on intuition. He said that he makes choices of fingering based on the finger on which he vibrates best. He also reported that when choosing a shift, he would choose the pattern that he was best able to execute. An example he gave was going from finger 1 to 3 or 2 to 4. He would chose the one with which he felt more comfortable.

When asked about choosing positions for performing a selection of music, he said that he usually chose positions based on artistic element. He would try to avoid open strings when performing solo literature. However, if playing in an orchestra section, he would choose position for ease of execution.

Participant Two

Participant Two began playing the violin in sixth grade at Porter Middle School. At Porter Middle School, he was taught using a traditional method book approach that involved exercises from currently published methods. In addition to the method book, orchestra literature was a part of his training. In seventh grade, he began taking private lessons. As a part of these lessons, he studied etudes, scales, and solo repertoire. At the time of the study, he was working on advanced solo pieces by Mendelssohn and Saint-Saëns. During his high school career, the participant was winner of a local symphony concerto competition. During the participant's time in the area orchestras, he was a member of the Region Orchestra four times. He was also a part of the Texas All State Orchestra on two occasions. As a senior, the student was co-concertmaster of the Austin Youth Orchestra.

When asked how he was taught to navigate the fingerboard, the participant said that he was taught to using finger patterns that felt comfortable. He said that he often shifted on one string when he was first learning a piece of music. He began to shift less once he was more comfortable with the musical selection. When choosing a position for a particular piece of music, he would make choices based on artistic decisions.

Practice music reading and performance trial

The two participants in this case study were given a music selection and a brief time period to prepare the selection for performance. The music was from Etude Number Sixty-nine from Hans Sitt (1928) *100 Etudes, Opus 32*. The original key of the piece was A^b major, but the selection was transposed to the key of A major in order to give the participants open strings with which to check intonation. The selection was chosen because it could be played in one position on the violin. No tempo markings were indicated on the selection.

The only instructions given to the participants were the amount of time that would be allowed to learn the selection of music. Approximately 5 minutes were given to each participant. The practice session was videotaped for later analysis. Following the completion of the practice session, the video was analyzed using the computer program *SCRIBE* (Duke & Farra, 1995).

Participant One used 5 minutes 37 seconds to rehearse the music. In this length of time, Participant One spent 3 minutes 41 seconds playing the music, 1 minute 40 seconds writing, and stopped and restarted a total of 36 times. The participant did not spend any time passively looking at the music. He was constantly playing the music or making notes on the music. These data may be seen in Table 16.

Participant Two used 6 minutes 11 seconds to rehearse. He spent 4 minutes 38 seconds playing the music, 1 minute 23 seconds writing, and stopped

and restarted a total of 7 times. The participant did not spend any time passively looking at the music. He was constantly playing the music or making notes on the music. These data may be seen in Table 16.

Table 16

Analysis of Sight-reading Sessions of Case Study Participants

	Participant One	Participant Two
Total time	5’37”	6’11”
Playing	3’41” (65.6%)	4’38” (74.9%)
Writing	1’40” (29.7%)	1’23” (22.4%)
Looking	0’00”	0’00”
Fingering	0’00”	0’00”
Stop/restart	36 times	7 times
Performance data		
No. of shifts	10	11
Tempo (quarter note)	96	64

The performance of each participant was also analyzed using SCRIBE (Duke & Farra, 1995). Participant One shifted a total of 10 times, and Participant Two shifted a total of eleven times. Participant One chose a tempo of quarter note

equal to approximately 96 beats per minute, and Participant Two chose a tempo of approximately 64 beats per minute.

Chapter 5: SUMMARY AND DISCUSSION

The ability to navigate the fingerboard is an important skill for any string player. In addition, the performer must be able to understand the relationship between the strings and the notes on the instrument. With an understanding of the fingerboard and the ability to perform patterns on the fingerboard, students can be more successful in playing stringed instruments.

One purpose of this study was to investigate a unique way of teaching and to provide information about ways for teachers to deliver information to students about fingerboard geography. Very little information on this topic has been written. Most of the research studies about methods and method books were designed to describe the information and the format in which it is delivered (Jeung, 1999; Johnson, 1994; Krueger, 1990; Wasson, 2000).

The focus of this project was to study the effects of an innovative teaching approach on students' ability to navigate the fingerboard. The ideas investigated in this study were developed by Dick and Scott (2000). This approach for teaching fingerboard geography is called "elevators and escalators." The effectiveness of this approach has been noted through informal observation of students who have worked with these two teachers.

This research study was designed to answer the following questions:

Main Study

1. Are there differences between students who receive traditional method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on written tests of note naming and finger placement?
2. Are there differences between students who receive traditional method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on performance tests incorporating chromatic finger patterns?

Ancillary Study

3. Does an advanced high school student who has been trained using the elevator and escalator approach to the fingerboard make different fingering choices than an advanced high school student trained using a method book approach when sight-reading a new selection of music? Do the students use different finger patterns when approaching the new musical selection and demonstrate knowledge of the relationship of notes across the strings?

Main Study

Participants for the main study were 57 students enrolled in beginning string instruction in two middle schools in the Austin (Texas) Independent School District. Students received approximately six weeks of instruction using researcher-designed materials. Students were pretested prior to beginning instruction. Intact classes were used. Following the instruction period, a posttest was given, and these data were analyzed.

Ancillary Study

The ancillary study involved two advanced high school seniors who had been trained using two different methods. Each had reached similar honors and achievement levels during the middle and senior public high school years.

SUMMARY OF RESULTS

Are there differences between students who receive traditional method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on written tests of note naming and finger placement?

On the pretest, there was no significant difference between the groups' ability to name the notes and to show the appropriate finger placement. The video

instruction group had a mean score of 25.94. The worksheet instruction group had a mean score of 31.58, and the control group had a mean score of 29.52. No significant differences were found between the groups on the posttest in the ability to name the notes and to show appropriate finger placement. The mean on the posttest was as follows for the three groups: Group One (Video)=29.82, Group Two (Worksheet)=34.63, and Group Three (Control)=30.48. Although the difference was not significant, the group that received the video treatment gained 3.88 points (on the 40-point) scale between the pretest and posttest. This was slightly more than the 3.05 gained by the worksheet group, and it was higher than the .96 gained by the control group. The standard deviation within these three groups was relatively large, although it was reduced from the pretest to posttest except for the control group.

Are there differences between students who receive traditional method book practice, elevator/escalator worksheet practice, or elevator/escalator video practice on performance tests incorporating chromatic finger patterns?

On the performance pretest, there was no significant difference in the number of errors that each group made. The video group had a mean of 3.41 errors, the worksheet group had a mean of 2.63 errors, and the control group had a mean of 4.14 errors. On the posttest, the video group had a mean of 2.88 errors, the worksheet group had a mean of 1.21 errors, and the control group had a mean

of 3.38 errors. No significant differences were found between the groups in the number of errors that were made on the performance posttest. When comparing the difference in errors between the pretest and posttest, no significant differences were found, although the group using the worksheet made the most improvement in performance by reducing mean errors from 2.63 to 1.21 out of a possible 16 (a difference of 1.42). The control group and video group both improved by less than 1 error from pretest to posttest. The standard deviation within each of the groups was reduced only slightly between the pretest and posttest.

Two additional lines of music were included on the performance posttest. These lines presented escalators to be performed. A significant difference was found between the groups in the ability to perform these lines. The difference between the worksheet elevator/escalator group and the control group was significant. No other significant difference was found. The video group had a mean of .18 errors out of a possible 10 notes. The worksheet group had a mean of .05 errors out of a possible 10 notes. The control group had the most errors with a mean of 1.71 errors out of a possible 10. The standard deviations for the video, worksheet, and control groups were 1.25, 0.46, and 2.05, respectively.

Does an advanced high school student who has been trained using the elevator and escalator approach to the fingerboard make different fingering choices than an advanced high school student trained using a method book

approach when sight-reading a new selection of music? Do the students use different finger patterns when approaching the new musical selection and demonstrate knowledge of the relationship of notes across the strings?

When analyzing the fingering choices made by the two students, it was found that the finger patterns chosen were not substantially different. The student trained using the elevator/escalator approach shifted 10 times while the student trained using the traditional method shifted 11 times. The number of pencil marks made by the violinists to assist with the finger patterns to be used also did not show large differences. Participant One made a total of 39 pencil marks, and Participant Two made 28 pencil marks.

The only notable difference between the two participants was in the number of times that the participants stopped and restarted during the five-minute practice time prior to the performance. During this time, Participant One, who was trained using elevators and escalators, stopped and restarted 36 times, and Participant Two, who received traditional training, stopped and restarted 7 times. Participant Two spent almost one minute more time performing the piece (i.e. performed with a much slower tempo) than Participant One.

DISCUSSION OF RESULTS

Results indicated no significant differences between the groups in the participants' ability to understand and to navigate the string fingerboard. The

majority of the students showed progress from the pretest to posttest. In only four cases did students score lower on the posttest than on the pretest.

The improvement made by the video group on the note naming and finger placement test was not significantly different from the other groups. The video group made an improvement of 3.88 points out of a possible 40. The worksheet group was second in improvement with a mean of 3.05 points. These two groups received the elevator and escalator instruction. The control group improved by less than one point. The small gain may have been due to the short treatment time of six weeks. Additional time with the material may have resulted in increased gain scores.

On the performance test, there was no significant difference between groups in the number of items that were performed incorrectly. The elevator/escalator worksheet group made the most improvement with a reduction in errors of 2.63 (out of 16) to 1.21 for a difference of 1.42 fewer errors. The control group improved their performance by .76 with a reduction in errors from 4.14 to 3.38. The video group made the least improvement with a reduction in errors from 3.41 to 2.88 for a difference of .53. One reason that the video group made less improvement than the other groups may be related to the mode of presentation that was used. The video group received primarily rote instruction that was given through the videotape. The posttest was in a written form. The students had to read the notes during the posttest performance. The worksheet group and control group received instruction using printed material. Since these

two groups were reading notes during the practice portion of the project, the posttest may have favored these groups.

Two additional lines of music were included on the posttests that were not a part of the pretest. These lines were examples of escalators and were intended to test the ability of the students to perform chromatic finger patterns on one string. A significant difference was found between the groups in the ability to perform this chromatic escalator pattern. The significant difference was between the worksheet group and the control group in the number of notes performed incorrectly. The worksheet group in particular and the video group to a lesser extent had fewer mean errors in the performance of the escalator. The difference was most likely due to the video and worksheet group playing elevators and escalators throughout the entire project. The control group played exercises that involved the chromatic movement between the same notes as the elevators and escalators, but few exercises approached the escalators in the way that the video and worksheet group did.

In the case study, the only differences of note were found in the approaches that the violinists took during the practice session prior to the performance trial. Participant One stopped and restarted a total of 36 times during his practice session. Each time that he stopped, he would practice a shift or isolate a few notes for repeated practice. The reason for this may have been because of the elevator/escalator training that the participant received. The elevator/escalator process involves finger patterns between strings, and the repeated trials may have been completed in order to isolate sequences of notes that could be played

between two or more strings in an upper position on the violin fingerboard. When Participant Two stopped (only 7 times), he would either write in a fingering, or he would practice a relatively large section of the music.

It is interesting to note that the performance level of the two participants was very much the same. Having started playing at about the same time, the participants were able to achieve similar results with two different teaching approaches. More extensive comparisons of a wider range of subjects and over a longer time period would reveal more information about the longer term effects of elevator/escalator training on more advanced students' performance abilities.

The tempos chosen by the participants were different by 32 beats per minute. Participant One performed the excerpt at 96 beats per minutes while Participant Two performed at 64 beats per minute. The faster tempo may be related to the number of times that Participant One stopped during practice. By stopping and rehearsing isolated sections of the music, the participant may have been more comfortable with the overall technical aspects of the excerpt.

RECOMMENDATIONS FOR FUTURE RESEARCH

The results from this study indicated no significant differences between the three treatment groups in the ability to name notes and in finger placement on the respective string instruments. Although all students were involved in the second semester beginning string class, the level of experiences and abilities were quite varied, and although not random, there were no differences in the groups' general musical knowledge or fingering errors on the pretest. The variability of

the scores within each of the groups may have been due to the wide range of experiences, whether or not students studied privately, and the abilities of students involved. A larger number of students in each group, as well as more homogeneous groups would be helpful in subsequent assessment of the different modes of instruction.

Future research could include the use of the same instructional media for each group. By comparing the traditional method book with the elevator and escalator groups using the same format such as both using worksheet or both using video formats, a more controlled assessment would be given of the effectiveness of the materials being used.

As noted by Kantorksi (1995), very few dissertations (less than 9%) that are related to the topic of strings have been devoted to the study of teaching methods. In order to improve the instruction being used with beginning string students, more research should be conducted that investigates the effectiveness of methods used to teach such students. In the area of instructional materials, many method books are produced in order to give teachers material to use with students. Research into the effectiveness of these materials should be completed.

Another area that should be studied further is string teacher training. Studies that involve the development of successful instructional models would be helpful in creating methods courses that meet the needs of pre-service teachers. These models could be developed through observation of expert teachers (see for example, Colprit, 2000). Such observations could be helpful in the development of the teaching skills of novice teachers.

Further, there is a need for longitudinal research on the effectiveness of different teaching methods. By looking at the effectiveness of a method over an extended period of time, a better idea of its effectiveness may be gained. By studying a group of students who began to play with the help of elevator/escalator instruction over a long period of time such as five to seven years, more detailed descriptions of the benefits of the approach would be possible. This type of research may be very time consuming, but string educators would benefit from extended studies on different teaching approaches.

IMPLICATIONS FOR TEACHERS

Although no significant differences between the elevator/escalator groups and the method book groups were found, there may be some benefit for using the elevator/escalator approach to instruction. The elevator and escalator approach to the string fingerboard is a unique way to teach students chromatic finger patterns. This approach may be beneficial to private teachers and classroom teachers because of the application to finger patterns in all positions.

The elevators and escalators assist the student in understanding which notes are available in a given position. By completely understanding the fingerboard, students may be able to more easily sight-read music that involves a variety of chromatic finger patterns. Also, elevators and escalators may assist with better intonation because of the ability to recognize patterns in a given position.

This approach to the fingerboard allows the teacher to introduce the notes on all strings from the beginning of instruction. Most method books do not reach

the C string on the cello and viola or the E string on the violin until late in volume one and sometimes well into volume two.

Elevators and escalators also introduce a variety of finger patterns. This keeps the student from locking the hand into one finger pattern. When the patterns are sequentially introduced, combinations of patterns may be connected in order to perform scales and exercises on all strings. Further research is necessary to investigate whether the use of the elevator/escalator approach is more effective than traditional method books used alone.

CONCLUSIONS

Results from the current study indicate that instruction by both a traditional method book approach and the elevators/escalators approach were effective in improving the note naming ability and performed string navigation ability of beginning string students. Although no significant differences were found in the ability of the groups to name the notes, the groups using the elevator/escalator approach made slightly larger gains. A longer instructional period may have been beneficial in giving a clearer picture of the benefits of elevators and escalators.

When comparing the instructional media used in this research, no differences were found. This is consistent with many other studies that have compared traditional methods with video and computer-aided instruction. Rote instruction using video may be beneficial in beginning string instruction. The video model may also be helpful to those teachers who are not string players.

The development of efficient and effective methods of instructing beginning string students to navigate the fingerboard is important for the early training of successful young musicians. Research should be continued in the attempt to create models of instruction that meet the needs of novice and experienced string teachers.

Appendix A

CONCEPT LESSON PLANNING FORM

Escalators— 1. Open, 2. first finger, 3. second finger (fourth on bass)

Elevators—1. Open 1; 2. Minor; 3. Major; 4. Major tetrachord

Lesson Planning Table

	Escalators			Elevators			
	1	2	3	1	2	3	4
Lesson 1	x						
Lesson 2	x						
Lesson 3	x						
Lesson 4	x						
Lesson 5	x	x					
Lesson 6	x	x					
Lesson 7	x	x					
Lesson 8			x				
Lesson 9		x					
Lesson 10	x	x	x				
Lesson 11	x	x	x				
Lesson 12	x	x	x				
Lesson 13	x	x	x				
Lesson 14	x	x	x				
Lesson 15	x	x	x				
Lesson 16				x			
Lesson 17				x	x		
Lesson 18				x	x		
Lesson 19						x	
Lesson 20				x	x	x	
Lesson 21							x
Lesson 22	x						
Lesson 23				x			
Lesson 24		x					
Lesson 25					x		
Lesson 26			x				
Lesson 27						x	
Lesson 28							x
Lesson 29	x	x	x				
Lesson 30				x	x	x	x

Video Group Lesson Plans

Lesson One

Terms used in this lesson:

Escalator: an escalator is "a moving staircase working on the principle of an endless chain" (Cayne, 1993, p. 321) When applying this principle to string playing, an escalator is movement from one note to the next on one string or the next adjacent string.

The escalators to be studied involve the following melodic pattern: whole step, half-step, half-step, half-step. The escalator covers the interval of a perfect fourth.

I. Teacher will define escalator
II. Students will watch the open escalator video
III. Students will name the notes of the open escalator: D E F F# G
IV. Students will play the notes of the open escalator on the D string

Lesson Two

Day two will begin with a review of the open escalator

I. Students will watch the open escalator video
II. Students will play the open escalator on the D string
III. Students will name the notes of the open escalator on the A string (A B C C# D)
IV. Students will perform the open escalator on the A string

Lesson Three

Day three will introduce the first finger escalator. The interval pattern is the same as before (whole step, half step, half step, and half step). On the D string the pattern will be E F# G G# A.

I. Students will watch the first finger escalator video.
II. Students will name the notes of the first finger escalator
III. Students will place the fingers on the string as they name the notes of the first finger escalator.
IV. Students will perform the open string escalator using quarter notes.

Lesson Four

In this lesson, the students will review the notes of the first finger escalator, and they will transfer the finger pattern to the A string.

I. Students will watch the first finger escalator.
II. Students will perform the first finger escalator on the D string.
III. Students will say the notes of the first finger escalator on the A string.
IV. Students will perform the first finger escalator on the A string.

Lesson Five

In day five, the students will review the open string and first finger escalators.

I. Students will recite the notes of the open string escalator on the D and A strings.
II. Students will perform the open string escalators on the D and A string.
III. Students will recite the notes of the first finger escalator on the D and A strings.
IV. Students will perform the first finger escalator on the D and A strings.

Lesson Six

I. Students will review the notes of the open and first finger escalator on the D and A strings.
II. Students will play the open and first finger A and D string escalators.
III. Students will recite the notes of the open G string escalator.
IV. Students will perform the notes of the open G string escalator.

Lesson Seven

I. Students will recite the notes of the open escalator on the G string.
II. Students will perform the open G string escalator.
III. Students will recite the notes of the open E string and C string escalator.
IV. Student will perform the open escalator on the E and C strings.

Lesson Eight

I. Students will recite the notes of the second finger escalator (fourth finger on Bass) on the D string.
II. Students will perform the second finger escalator on the D string.
III. Students will recite the notes of the second finger escalator on the A string.
IV. Students will perform the second finger escalator on the A string.

Lesson Nine

I. Students will recite the notes of the second finger escalators on the D and A strings.
II. Students will perform the notes of the second finger escalator on the D and A strings.
III. Students will recite the notes of the second finger escalator on the G string.
IV. Students will perform the second finger escalator on the G string.
V. Students will recite the notes of the second finger escalator on the E and C strings.
VI. Students will perform the notes of the E and C string second finger escalator.

Lesson Ten

This lesson was a review lesson. In this lesson, students reviewed all three escalators on all four strings.

Lesson Eleven through Fifteen

In these lessons, students practice each of the escalators on the four strings. The sequence of instruction for each day will be the same, but lessons will focus on a different string each day. Below is the order of review for lessons eleven through fifteen.

Lesson Eleven will review all D string escalators.
Lesson Twelve will review all A string escalators.
Lesson Thirteen will review all G string escalators
Lesson Fourteen will review the E and C string escalators
Lesson Fifteen will review all escalators on all four strings.

I. Students name the notes of the open escalator.
II. Students will play the notes of the open escalator.
III. Students will say the notes of the first finger escalator.
IV. Students will play the notes of the first finger escalator.
V. Students will say the notes of the second finger (fourth finger on bass) escalator.
VI. Students will play the notes of the second finger escalator.

Lesson Sixteen

This lesson was for introduction of the elevator concept.

I. Ask the students what they think an elevator does?
II. Relate the responses to the stringed instrument. Talk about what happens on different strings (finger patterns).
III. Students watch the First finger elevator.
IV. Student says the note names of the first finger elevator.
V. Students play the first finger elevator.

Lesson Seventeen

I. Review what an elevator is in relation to string playing.
II. Students name the notes of the first finger elevator.
III. Students play the notes of the first finger elevator
IV. Students watch the minor elevator.
V. Students say the notes of the minor elevator.

Lesson Eighteen

I. Students review the notes of the first finger elevator and perform it on their instruments.
II. Students review the notes of the minor elevator and perform it on their instruments.

Lesson Nineteen

I. Students watch the video of the major elevator.
II. Students say the notes of the major elevator.
III. Students play the notes of the major elevator on their instruments.

Lesson Twenty

I. Students review the notes of the three elevators studied to this point.
II. Students perform each of the elevators on their instruments.

Lesson Twenty-one

I. Students watch the video for the major tetrachord elevator.
II. Students say the notes of the major tetrachord elevator.
III. Students perform the major tetrachord elevator on their instruments.

Lessons Twenty-two through Thirty

In these lessons, students will be practicing the notes of all escalators and elevators that have been learned. The following sequence will be used to review and practice:

I. Students will name the notes of the concept being studied.
II. Students will play the notes of the concept being studied.

Lesson Twenty-two—Open escalator on all four strings
Lesson Twenty-three—First finger elevator
Lesson Twenty-four—First finger escalator on all four strings
Lesson Twenty-five—Minor elevator
Lesson Twenty-six—Second finger escalator on all four strings
Lesson Twenty-seven—Major elevator
Lesson Twenty-eight—Major tetrachord elevator
Lesson Twenty-nine—All escalators
Lesson Thirty—All elevators

Worksheet Group Lesson Plans

Lesson One

Terms used in this lesson:

Escalator: an escalator is "a moving staircase working on the principle of an endless chain" (Cayne, 1993, p. 321) When applying this principle to string playing, an escalator is movement from one note to the next on one string or the next adjacent string.

The escalators to be studied involve the following melodic pattern: whole step, half-step, half-step, half-step. The escalator covers the interval of a perfect fourth.

I. Teacher will define escalator
II. Students will name the notes of the open escalator: D E F F# G
III. Students will play the notes of the open escalator on the D string

Lesson Two

Day two will begin with a review of the open escalator

I. Students will play the open escalator on the D string
II. Students will name the notes of the open escalator on the A string (A B C C# D)
III. Students will perform the open escalator on the A string

Lesson Three

Day three will introduce the first finger escalator. The interval pattern is the same as before (whole step, half step, half step, and half step). On the D string the pattern will be E F# G G# A.

I. Students will name the notes of the first finger escalator
II. Students will place the fingers on the string as they name the notes of the first finger escalator.
III. Students will perform the open string escalator using quarter notes.

Lesson Four

In this lesson, the students will review the notes of the first finger escalator, and they will transfer the finger pattern to the A string.

I. Students will perform the first finger escalator on the D string.
II. Students will say the notes of the first finger escalator on the A string.
III. Students will perform the first finger escalator on the A string.

Lesson Five

In day five, the students will review the open string and first finger escalators.

I. Students will recite the notes of the open string escalator on the D and A strings.
II. Students will perform the open string escalators on the D and A string.
III. Students will recite the notes of the first finger escalator on the D and A strings.
IV. Students will perform the first finger escalator on the D and A strings.

Lesson Six

I. Students will review the notes of the open and first finger escalator on the D and A strings.
II. Students will play the open and first finger A and D string escalators.
III. Students will recite the notes of the open G string escalator.
IV. Students will perform the notes of the open G string escalator.

Lesson Seven

I. Students will recite the notes of the open escalator on the G string.
II. Students will perform the open G string escalator.
III. Students will recite the notes of the open E string and C string escalator.
IV. Student will perform the open escalator on the E and C strings.

Lesson Eight

I. Students will recite the notes of the second finger escalator (fourth finger on Bass) on the D string.
II. Students will perform the second finger escalator on the D string.
III. Students will recite the notes of the second finger escalator on the A string.

IV. Students will perform the second finger escalator on the A string.

Lesson Nine

I. Students will recite the notes of the second finger escalators on the D and A strings.
II. Students will perform the notes of the second finger escalator on the D and A strings.
III. Students will recite the notes of the second finger escalator on the G string.
IV. Students will perform the second finger escalator on the G string.
V. Students will recite the notes of the second finger escalator on the E and C strings.
VI. Students will perform the notes of the E and C string second finger escalator.

Lesson Ten

This lesson was a review lesson. In this lesson, students reviewed all three escalators on all four strings.

Lesson Eleven through Fifteen

In these lessons, students practice each of the escalators on the four strings. The sequence of instruction for each day will be the same, but lessons will focus on a different string each day. Below is the order of review for lessons eleven through fifteen.

Lesson Eleven will review all D string escalators.
Lesson Twelve will review all A string escalators.
Lesson Thirteen will review all G string escalators
Lesson Fourteen will review the E and C string escalators
Lesson Fifteen will review all escalators on all four strings.

I. Students name the notes of the open escalator.
II. Students will play the notes of the open escalator.
III. Students will say the notes of the first finger escalator.
IV. Students will play the notes of the first finger escalator.
V. Students will say the notes of the second finger (fourth finger on bass) escalator.
VI. Students will play the notes of the second finger escalator.

Lesson Sixteen

This lesson was for introduction of the elevator concept.

I. Ask the students what they think an elevator does?
II. Relate the responses to the stringed instrument. Talk about what happens on different strings (finger patterns).
III. Student says the note names of the first finger elevator.
IV. Students play the first finger elevator.

Lesson Seventeen

I. Review what an elevator is in relation to string playing.
II. Students name the notes of the first finger elevator.
III. Students play the notes of the first finger elevator
IV. Students say the notes of the minor elevator.

Lesson Eighteen

I. Students review the notes of the first finger elevator and perform it on their instruments.
II. Students review the notes of the minor elevator and perform it on their instruments.

Lesson Nineteen

I. Students say the notes of the major elevator.
II. Students play the notes of the major elevator on their instruments.

Lesson Twenty

I. Students review the notes of the three elevators studied to this point.
II. Students perform each of the elevators on their instruments.

Lesson Twenty-one

I. Students say the notes of the major tetrachord elevator.
II. Students perform the major tetrachord elevator on their instruments.

Lessons Twenty-two through Thirty

In these lessons, students will be practicing the notes of all escalators and elevators that have been learned. The following sequence will be used to review and practice:

I. Students will name the notes of the concept being studied.
II. Students will play the notes of the concept being studied.

Lesson Twenty-two—Open escalator on all four strings
Lesson Twenty-three—First finger elevator
Lesson Twenty-four—First finger escalator on all four strings
Lesson Twenty-five—Minor elevator
Lesson Twenty-six—Second finger escalator on all four strings
Lesson Twenty-seven—Major elevator
Lesson Twenty-eight—Major tetrachord elevator
Lesson Twenty-nine—All escalators
Lesson Thirty—All elevators

Control Group Lesson Plans

Lesson One

I. Students will name the notes of All for Strings Volume 1, Line 146
II. Students will play the notes of Line 146

Lesson Two

I. Students will name the notes of All for Strings Volume 1, Line 161
II. Students will perform the notes of Line 161

Lesson Three

I. Students will name the notes of lines 113 & 114 of All For Strings Volume 2
II. Students will place the fingers on the string as they name the notes.
III. Students will perform the lines.

Lesson Four

In this lesson, the students will review the notes of lines Volume 1 lines 146 & 161 and Volume 2 lines 113 & 114.

I. Students will name the notes of the line while putting fingers on the string.
II. Students will perform the first finger escalator on the A string.

Lesson Five

In day five, the students will play Volume 1 lines 141 & 155

I. Students will recite the notes of the note
II. Students will perform the line

Lesson Six

In day six, the students will play Volume 1 lines 112 and Volume 2 lines 113

I. Students will recite the notes of the note
II. Students will perform the line

Lesson Seven

In day seven, the students will play Volume 1 line 176 and Volume 2 line 114

I. Students will recite the notes of the note
II. Students will perform the line

Lesson Eight

In day eight, the students will play Volume 2 lines 22 & 80

I. Students will recite the notes of the note
II. Students will perform the line

Lesson Nine

In day nine, the students will play Volume 2 lines 22, 69, & 70

I. Students will recite the notes of the note
II. Students will perform the line

Lesson Ten

This lesson was a review lesson. In this lesson, students review all lines from the *All for Strings Volumes 1 & 2* method book that have been studied to this point.

Lesson Eleven through Fifteen

In these lessons, students practice the musical excerpts studied to this point. The lessons will focus on a different string each day. Below is the order of review for lessons eleven through fifteen.

Lesson Eleven will review Volume 1 line 146 and Volume 2 lines 22C & 80
Lesson Twelve will review Volume 1 line 161 and Volume 2 lines 69 & 80
Lesson Thirteen will review Volume 2 lines 113, 22, & 70
Lesson Fourteen will review Volume 2 lines 22, 114, & 70
Lesson Fifteen will review Volume 1 lines 146, 161 and Volume 2 lines 22, 69, 70, 80, 113, 114

I. Students will name the notes of the line
II. Student will perform the line

Lesson Sixteen

This lesson will study finger patterns that occur between strings.

I. Students will name the notes of Volume 1 lines 29, 65, & 94
II. Students will perform each of the lines

Lesson Seventeen

I. Students will name the notes of Volume 1 lines 110 & 167 and Volume 2 lines 141 & 155
II. Students will perform each of the lines

Lesson Eighteen

I. Students will name the notes of Volume 1 lines 110 & 167
II. Students will perform each of the lines

Lesson Nineteen

I. Students say the notes of Volume 1 line 176 and Volume 2 lines 22 & 25
II. Students play the notes of the major elevator on their instruments.

Lesson Twenty

I. Students review the notes of the lines studied to this point. Volume 1 lines 29, 65, 94, 110, & 167 and Volume 2 lines 22 & 25
II. Students perform each of the elevators on their instruments.

Lesson Twenty-one

I. Students say the notes of Volume 2 lines 22 & 26
II. Students perform the lines on their instruments

Lessons Twenty-two through Thirty

In these lessons, students will be practicing the notes of exercises that have been learned. The following sequence will be used to review and practice:

I. Students will name the notes of the line being studied.
II. Students will play the notes of the line being studied.

Lesson Twenty-two—Volume 1 lines 146 & 161
Lesson Twenty-three—Volume 2 lines 113 & 114
Lesson Twenty-four—Volume 1 lines 176, 155, & 141
Lesson Twenty-five—Volume 1 lines 94, 110, & 167
Lesson Twenty-six—Volume 2 lines 22, 69, 70, & 80
Lesson Twenty-seven—Volume 1 line 176 and Volume 2 lines 22 & 25
Lesson Twenty-eight—Volume 2 lines 22 & 26
Lesson Twenty-nine—Volume 1 lines 141, 146, 155, & 176
Lesson Thirty—Volume 1 lines 29, 94, & 176 and Volume 2 lines 22, 25, & 26

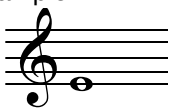
Appendix B

GENERAL KNOWLEDGE PRETEST AND POSTTEST

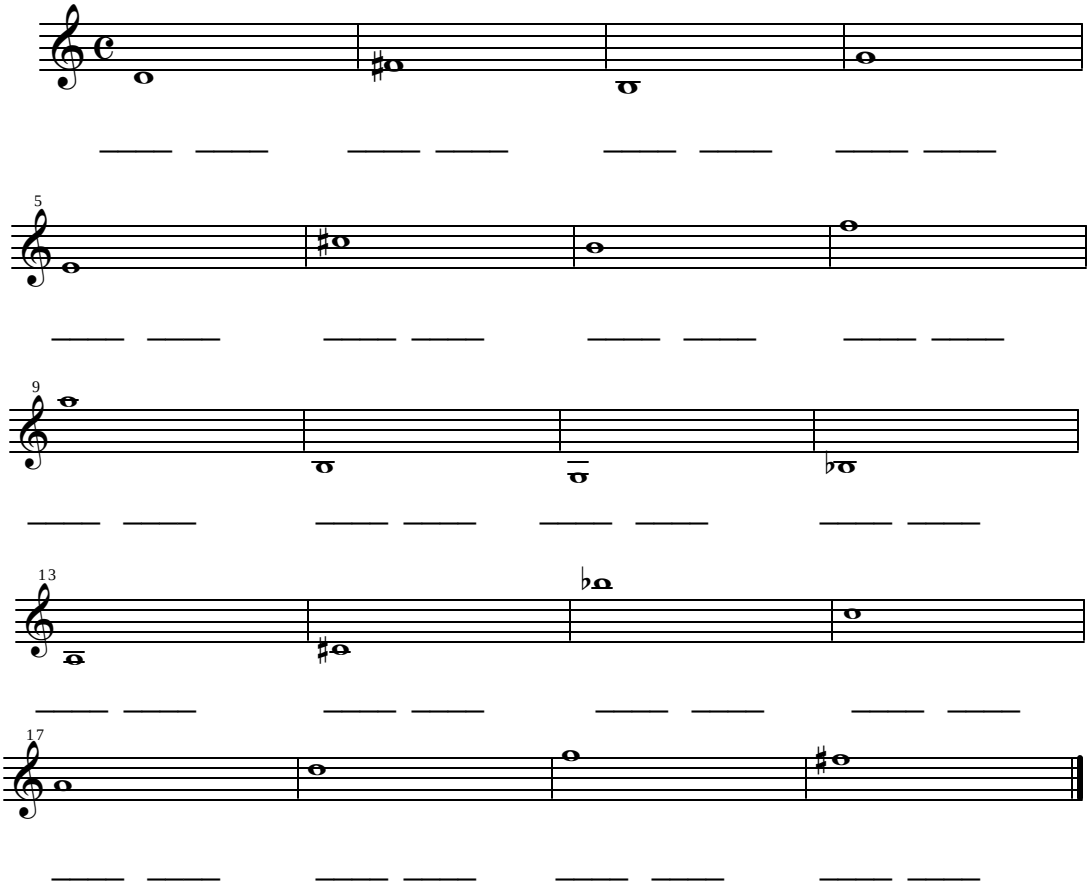
Violin

In the space provided, name the following notes and how you would perform it on your instrument.

Example



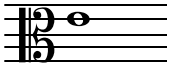
E D1



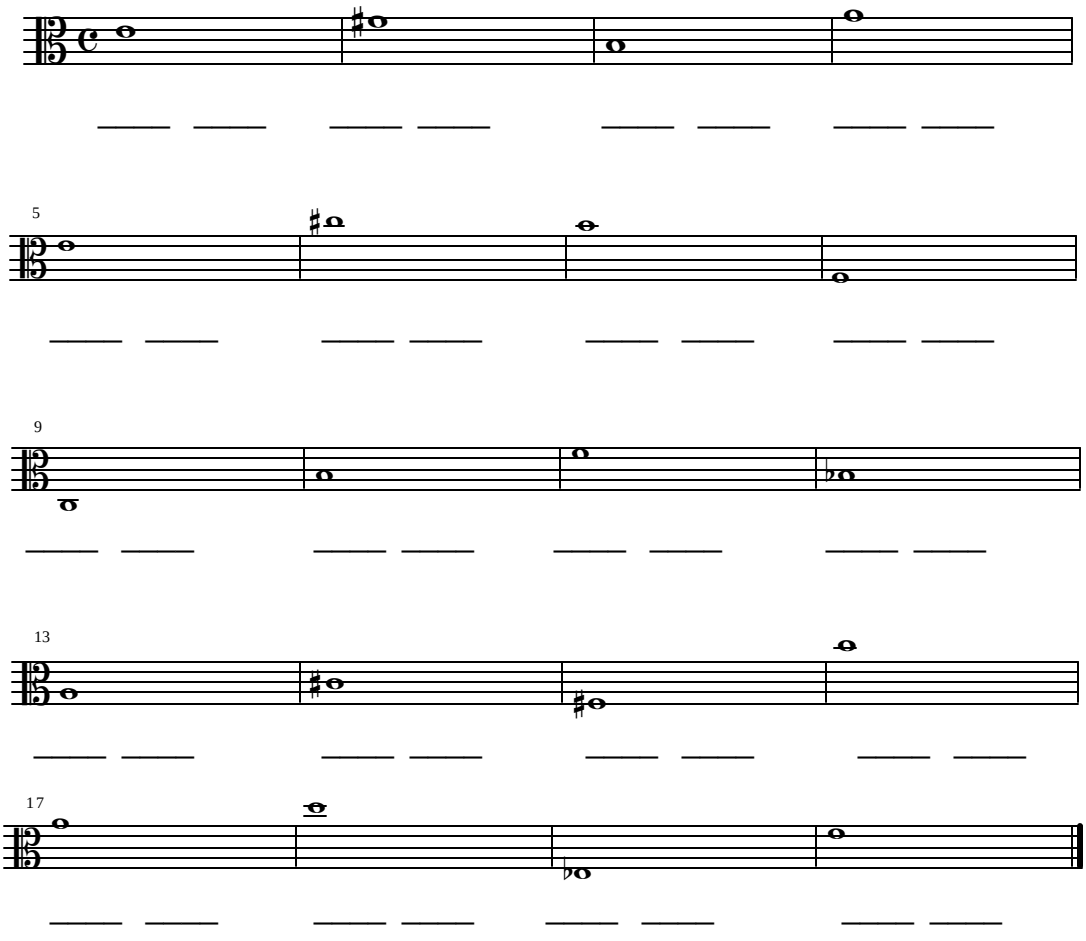
Viola

In the space provided, name the following notes and how you would perform it on your instrument.

Example



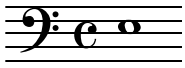
E D1



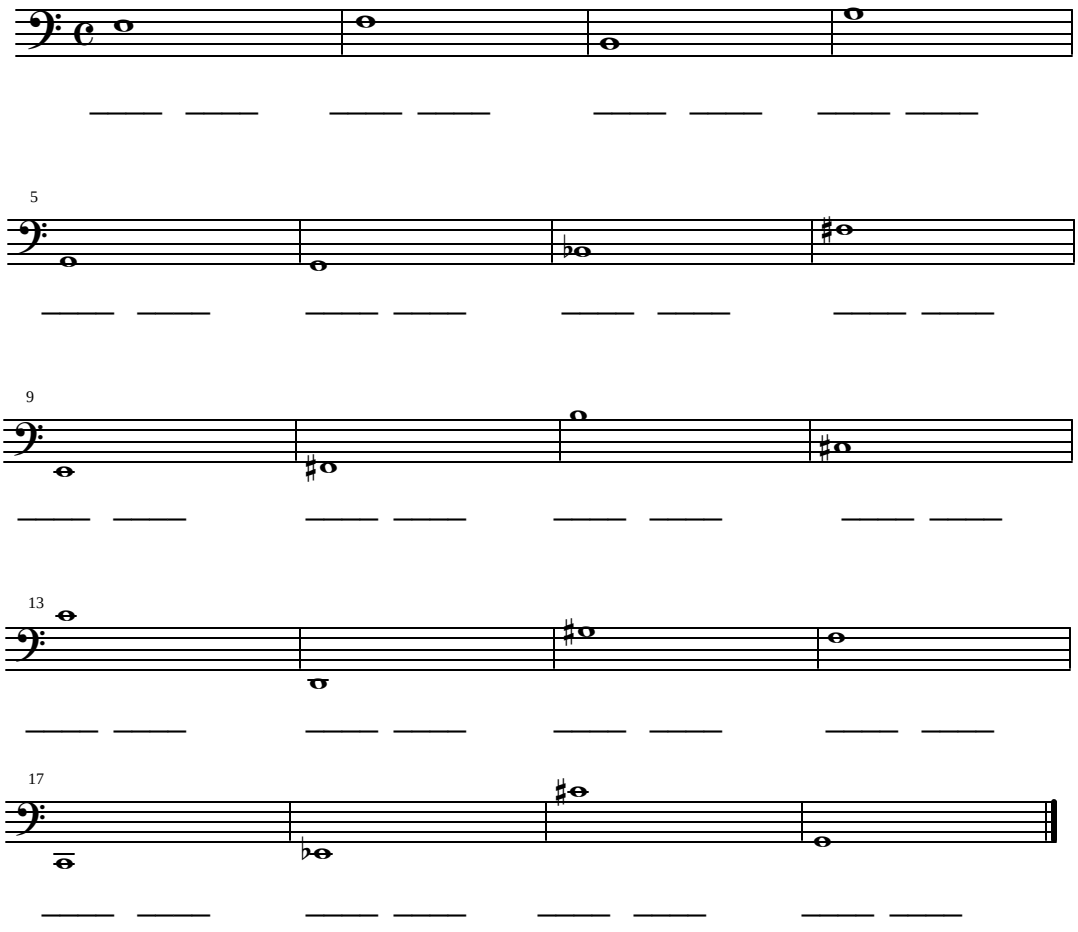
Cello

In the space provided, name the following notes and how you would perform it on your instrument.

Example



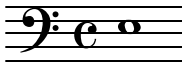
E D1



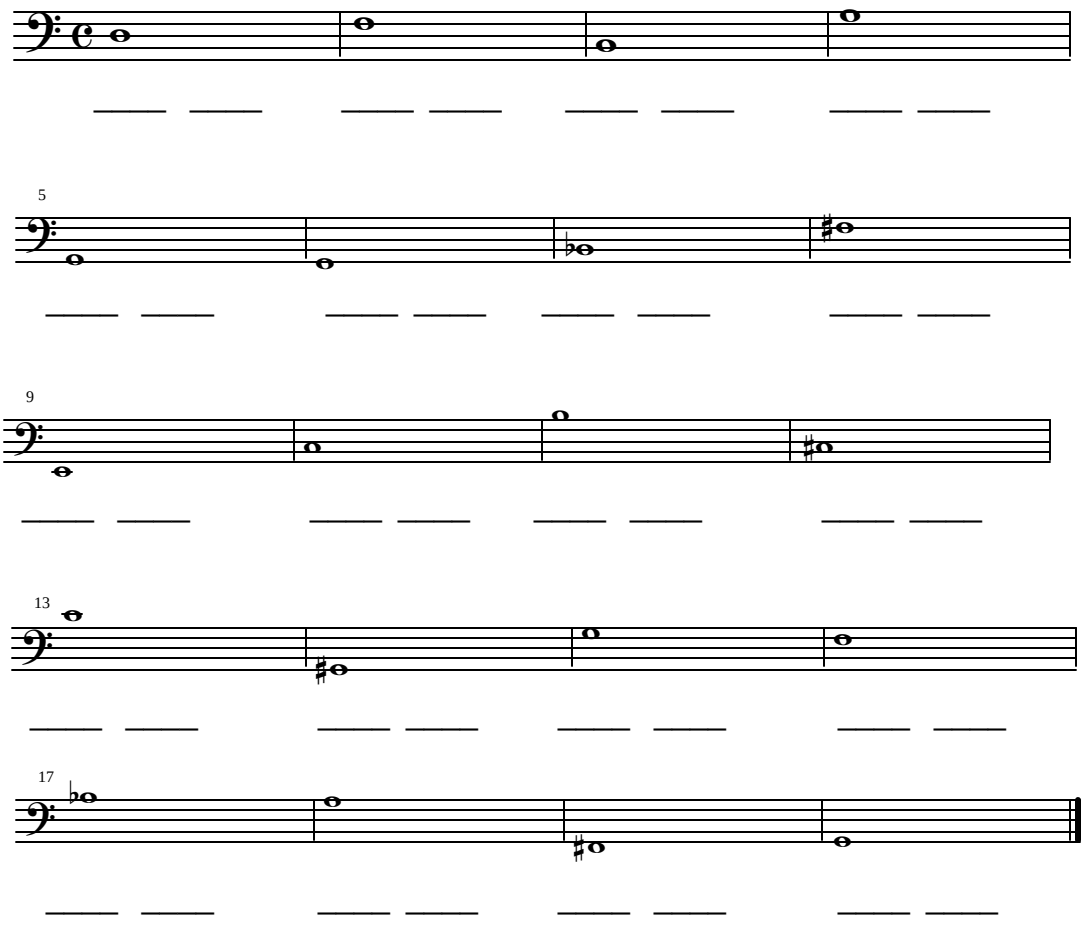
Bass

In the space provided, name the following notes and how you would perform it on your instrument.

Example



E D1

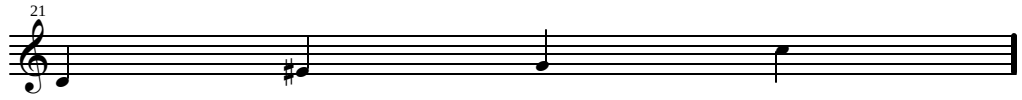


PERFORMANCE PRETEST

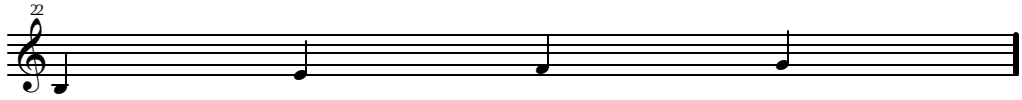
Violin

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

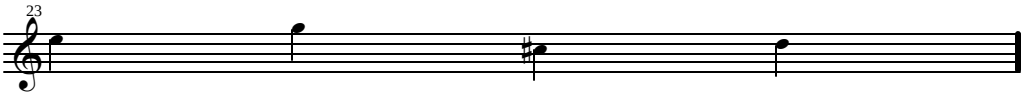
1.



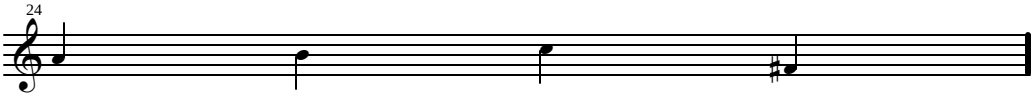
2.



3.



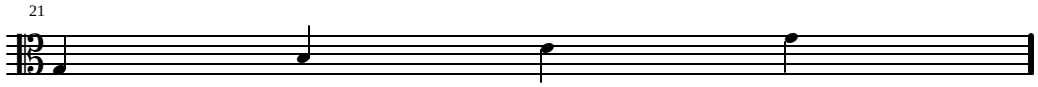
4.



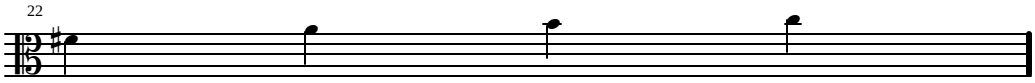
Viola

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

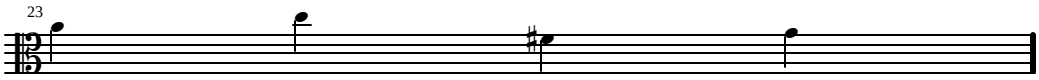
1.



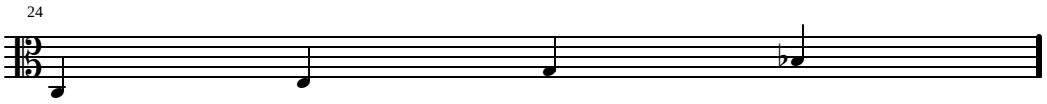
2.



3.



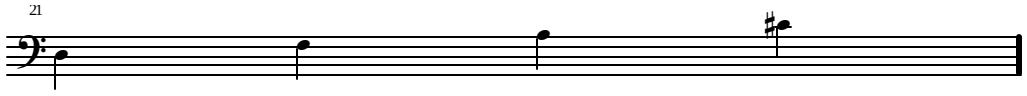
4.



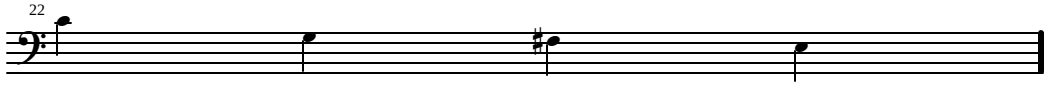
Cello

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

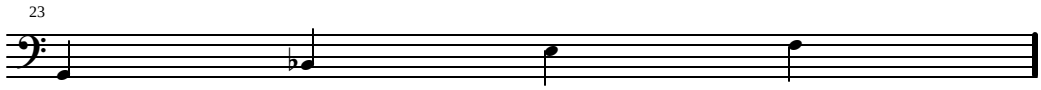
1.



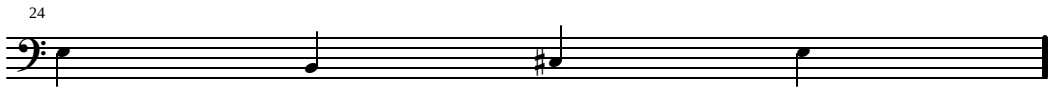
2.



3.



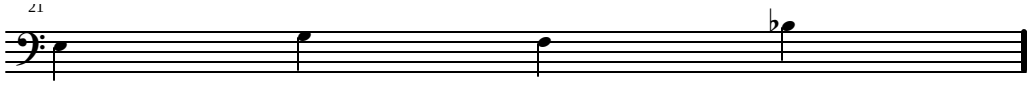
4.



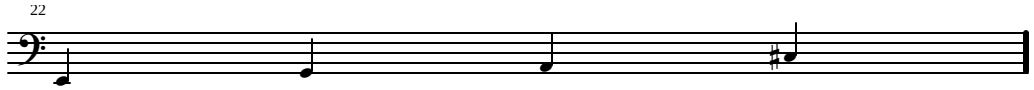
Bass

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

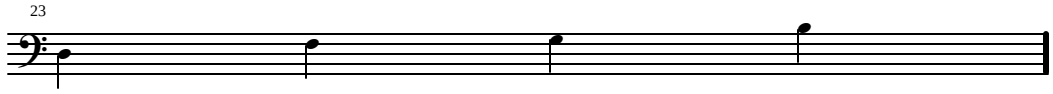
1.



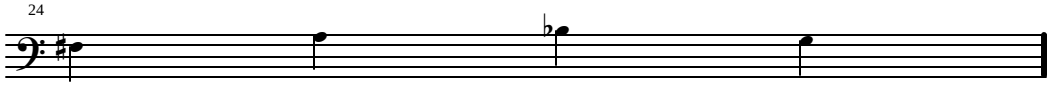
2.



3.



4.

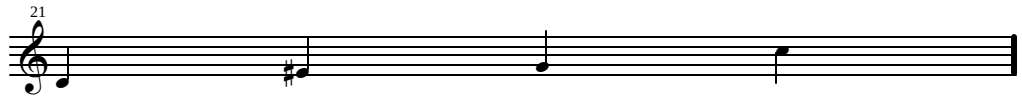


PERFORMANCE POSTTEST

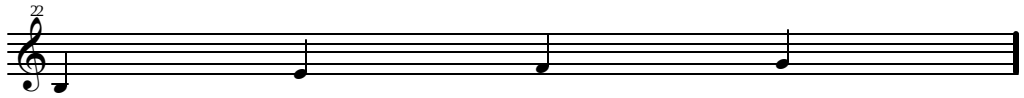
Violin

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

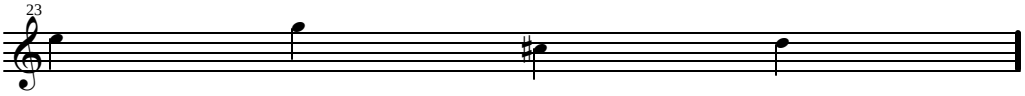
1.



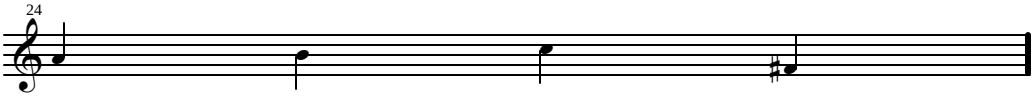
2.



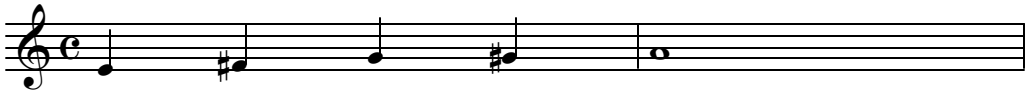
3.



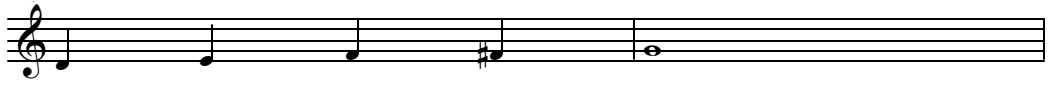
4.



5.



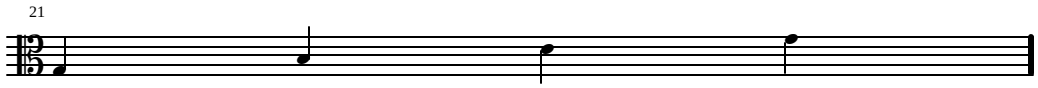
6.



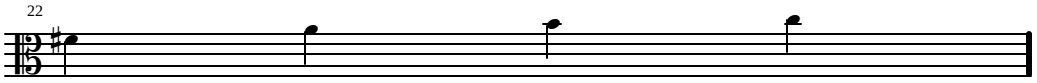
Viola

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

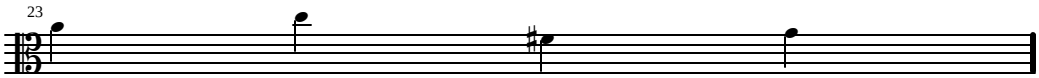
1.



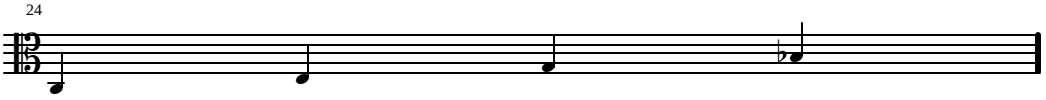
2.



3.

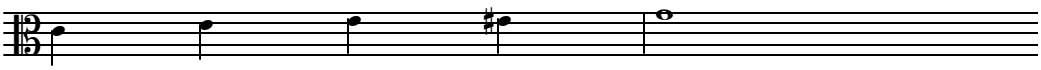


4.



5.

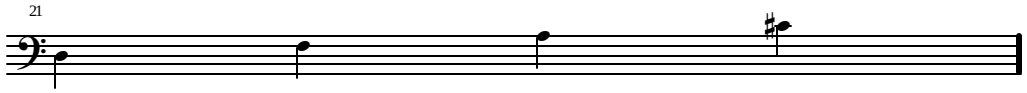
6.



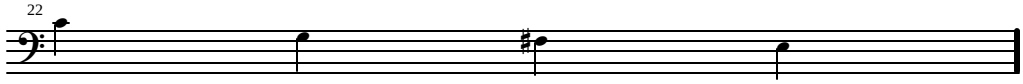
Cello

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

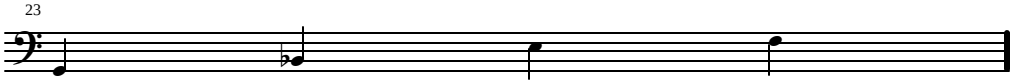
1.



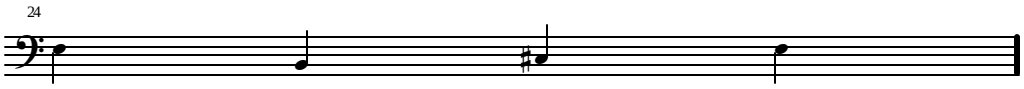
2.



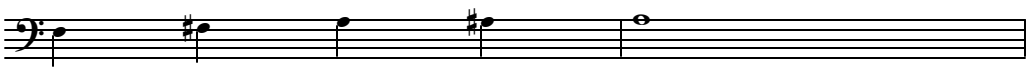
3.



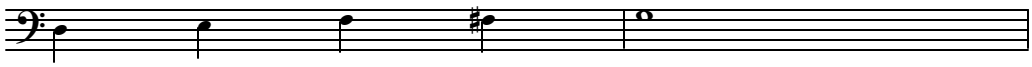
4.



5.



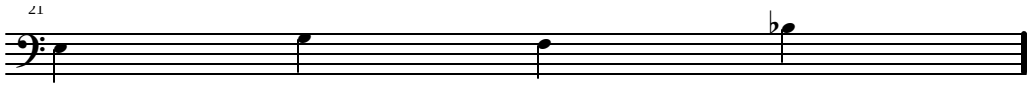
6.



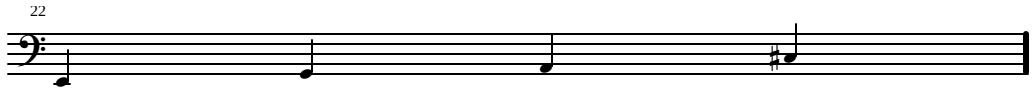
Bass

Name the notes of each pattern. After naming the notes, perform the pattern on your instrument.

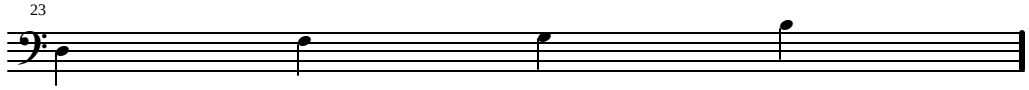
1.



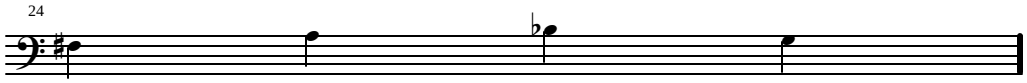
2.



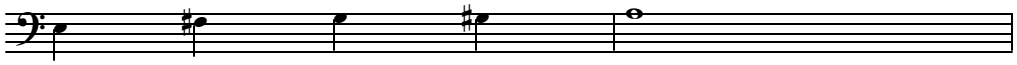
3.



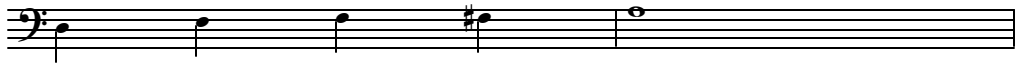
4.



5.



6.



Appendix C

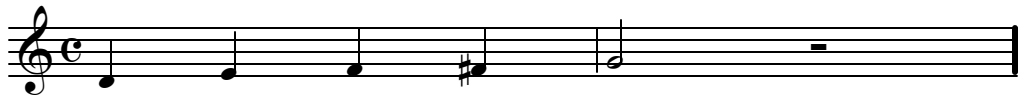
ESCALATOR WORKSHEETS

D Escalators

Violin D Escalators

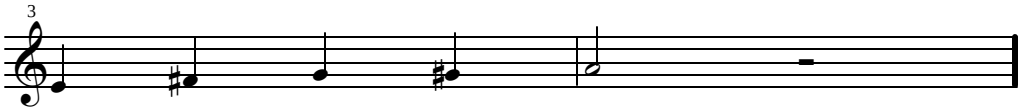
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



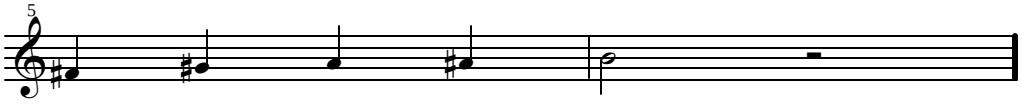
0 1 2 –slide—2 3

First Finger Escalator



1 2 3 --slide— 3 4

Second Finger Escalator

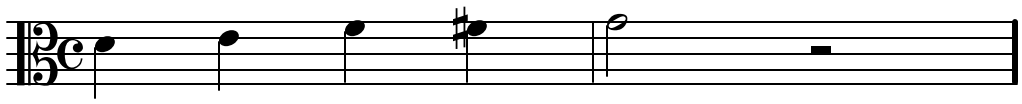


2 3 0 1 --slide-- 1

Viola D Escalators

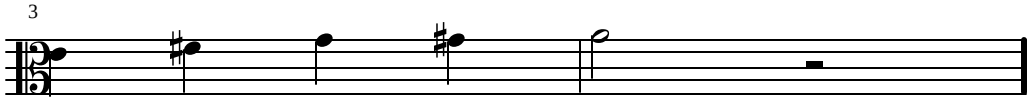
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



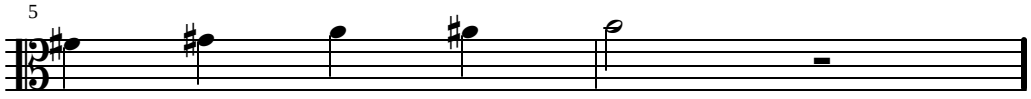
0 1 2 –slide-- 2 3

First Finger Escalator



1 2 3 --slide—3

Second Finger Escalator

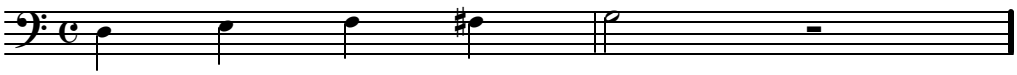


2 3 0 1 --slide-- 1

Cello D Escalators

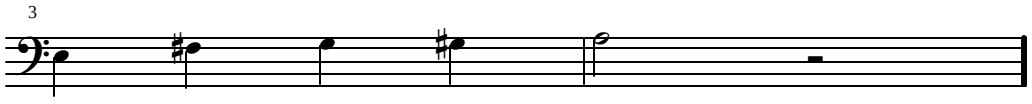
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



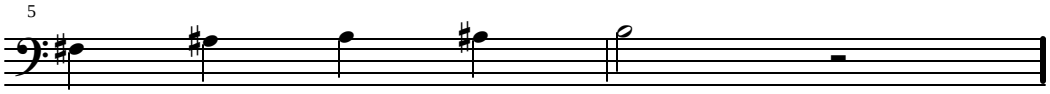
0 1 2 3 4

First Finger Escalator



1--extend—2 3 4 --shift-- 1

Second Finger Escalator

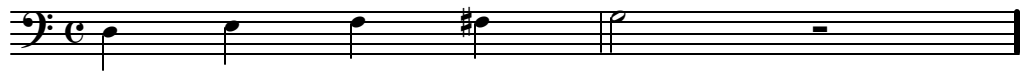


2—extend—4 0 1 --slide-- 1

Bass D Escalators

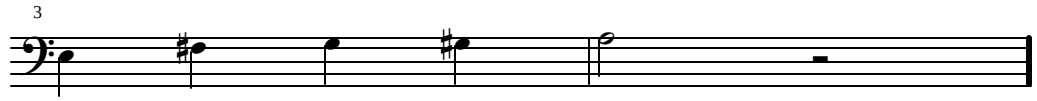
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



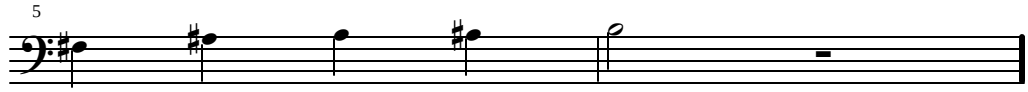
0 1 2 4 --shift-- 1

First Finger Escalator



1 4 0 1 1

Second Finger Escalator



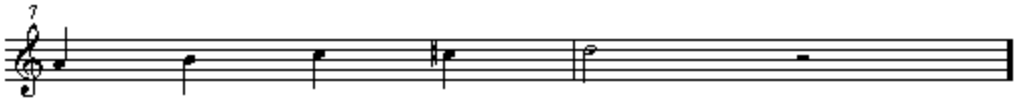
4 1 ---shift—1 2 4

A Escalators

Violin A Escalators

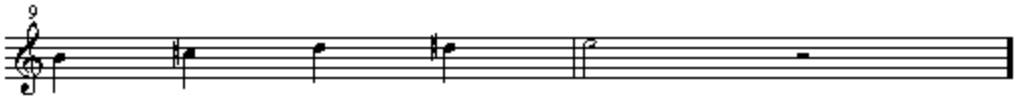
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



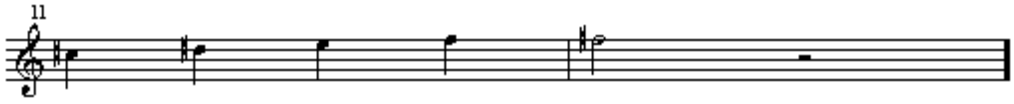
0 1 2 –slide-- 2 3

First Finger Escalator



1 2 3 --slide— 3 4

Second Finger Escalator

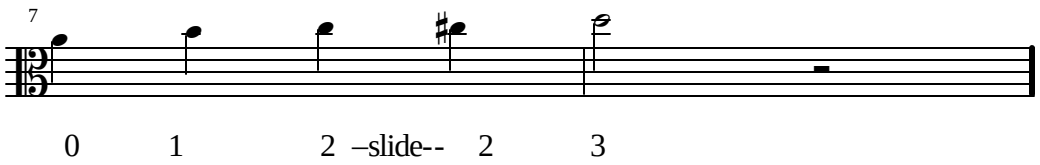


2 3 1 2 --slide-- 2

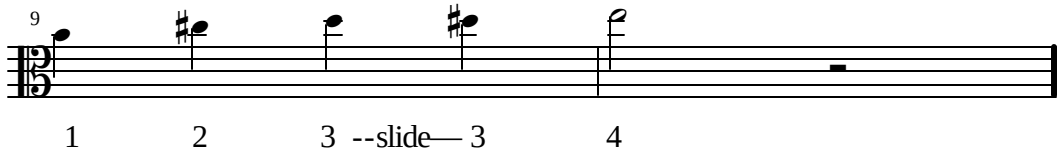
Viola A Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

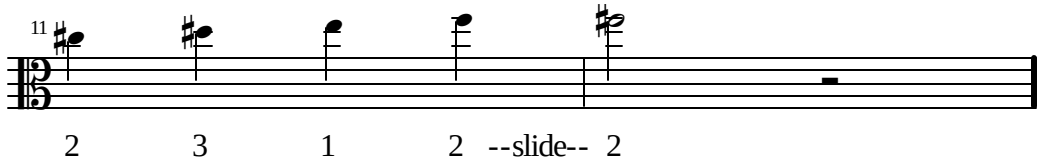
Open Escalator



First Finger Escalator



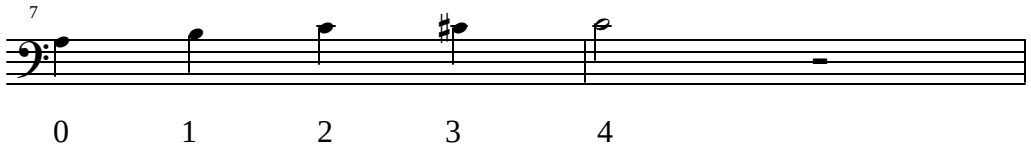
Second Finger Escalator



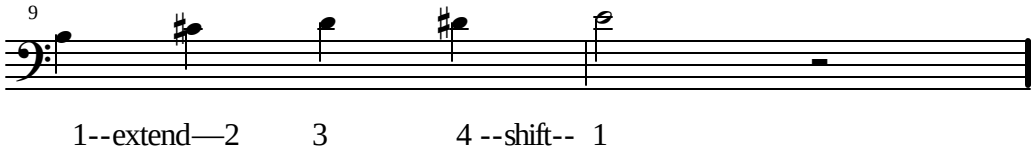
Cello A Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

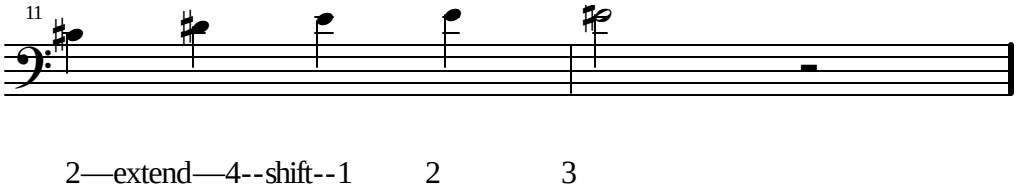
Open Escalator



First Finger Escalator



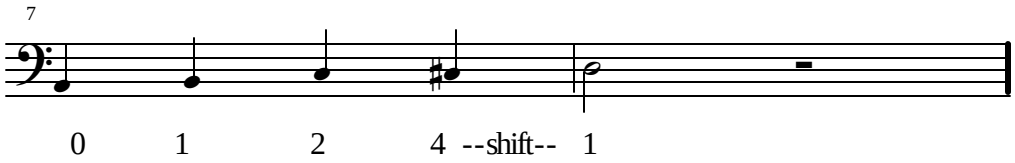
Second Finger Escalator



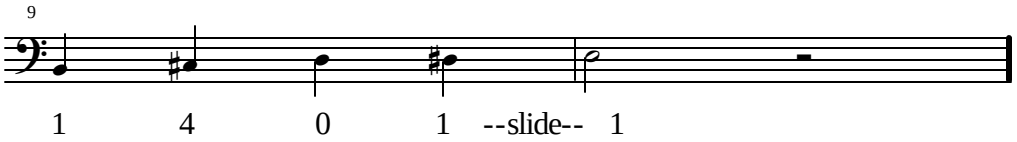
Bass A Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

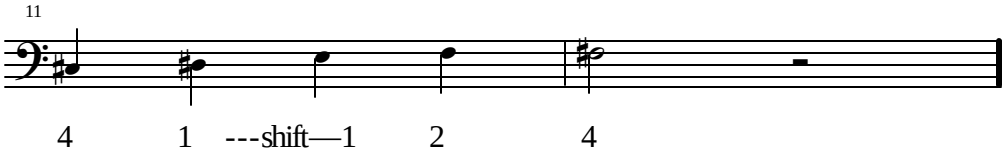
Open Escalator



First Finger Escalator



Fourth Finger Escalator

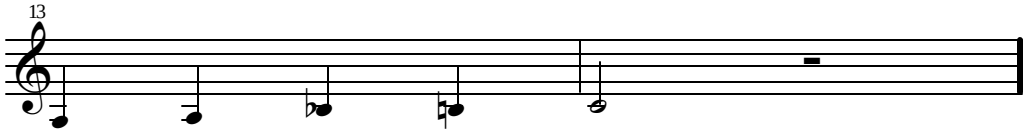


G Escalators

Violin G Escalators

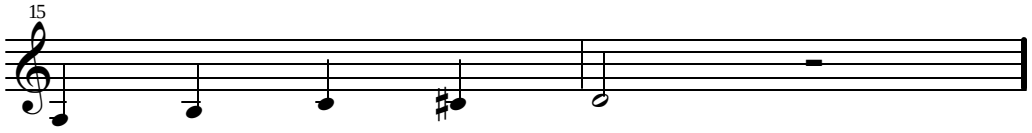
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



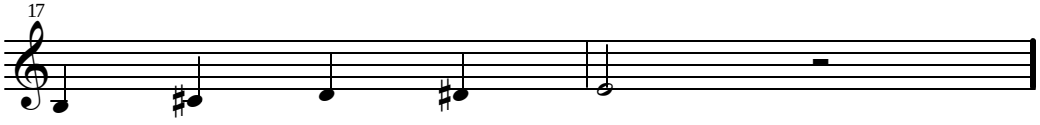
0 1 2 –slide-- 2 3

First Finger Escalator



1 2 3 --slide— 3 4

Second Finger Escalator

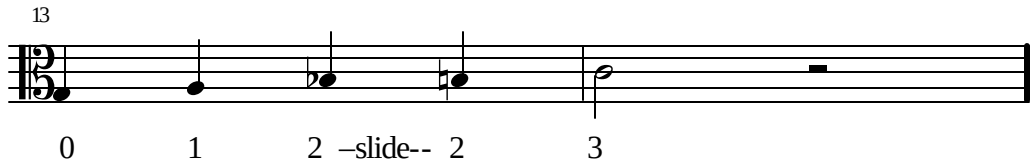


2 3 0 1 --slide—1

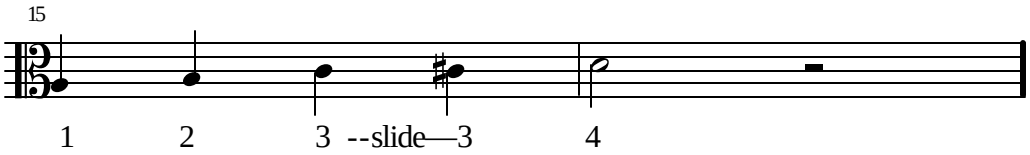
Viola G Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

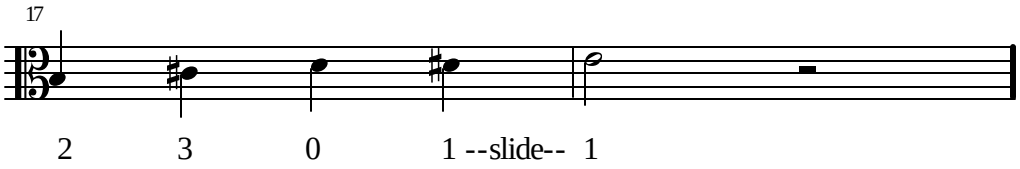
Open Escalator



First Finger Escalator



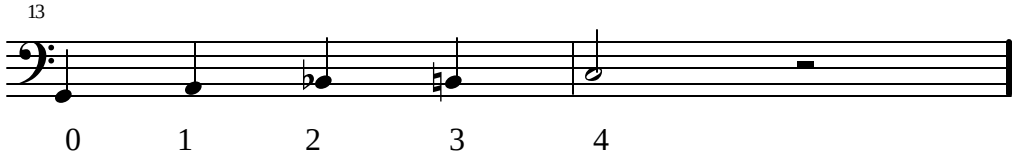
Second Finger Escalator



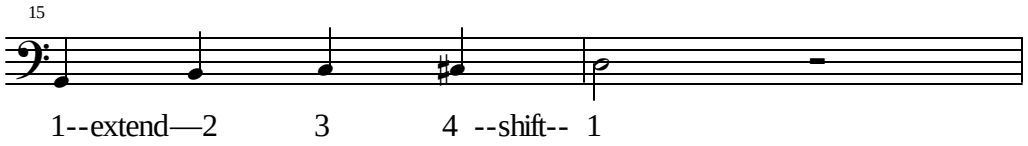
Cello G Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

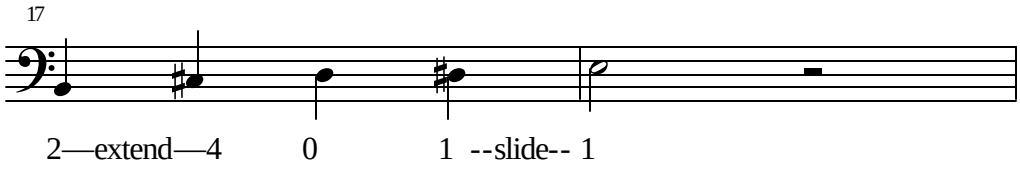
Open Escalator



First Finger Escalator



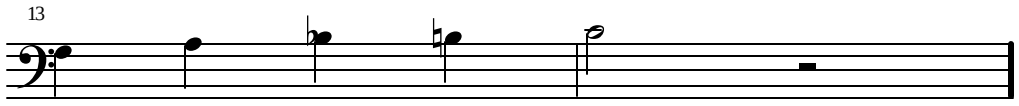
Second Finger Escalator



Bass G Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator

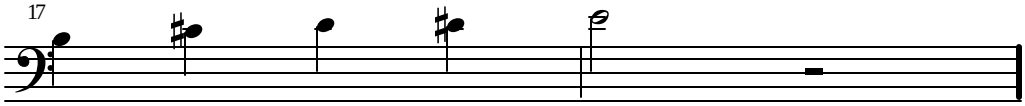


0 1 2 4 --shift-- 1

First Finger Escalator

1 4 --shift-- 1 2 4

Second Finger Escalator



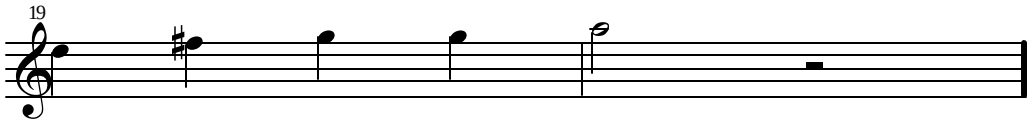
4 --shift-- 2 4 --shift-- 1 2

E Escalators

Violin E Escalators

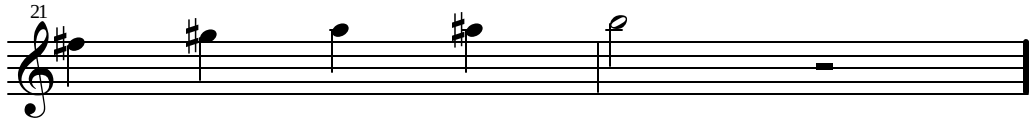
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



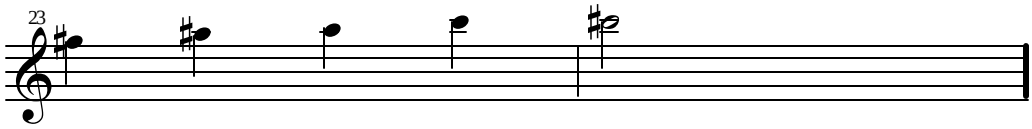
0 1 2 –slide-- 2 3

First Finger Escalator



1 2 3 --slide— 3 4

Second Finger Escalator

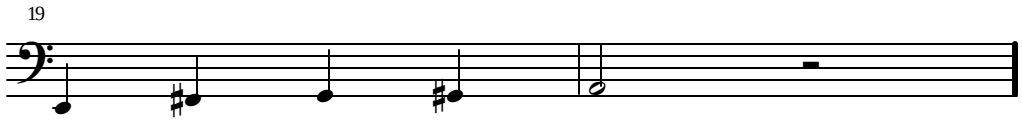


2 3 4 --slide—1 2

Bass E Escalators

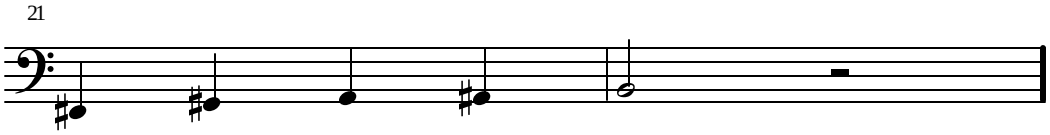
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



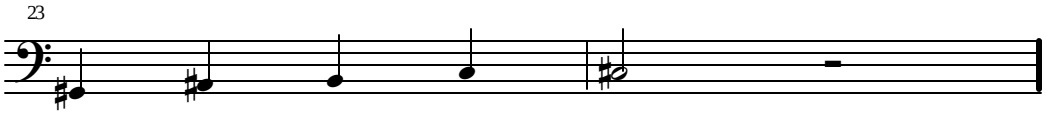
0 1 2 4 --shift-- 1

First Finger Escalator



1 4 0 1 --slide-- 1

Fourth Finger Escalator



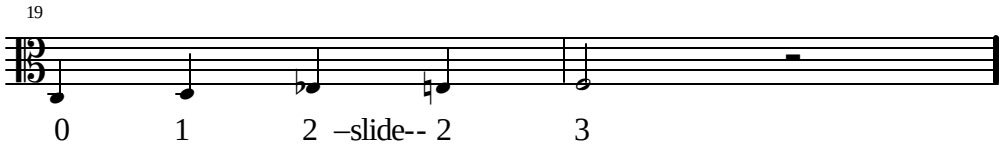
4 1 –slide-- 1 2 4

C Escalators

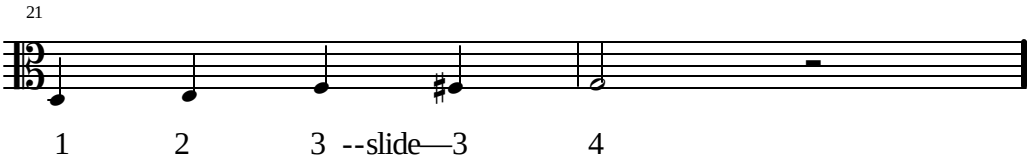
Viola C Escalators

Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

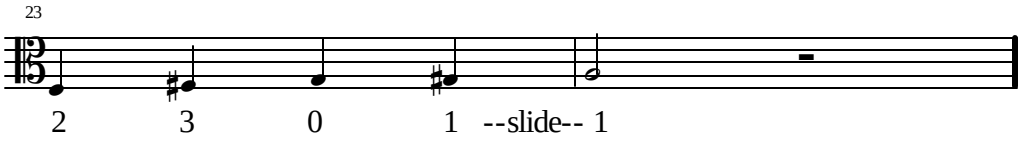
Open Escalator



First Finger Escalator



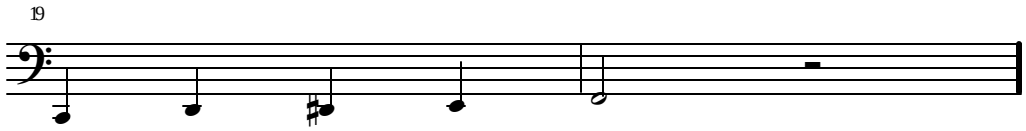
Second Finger Escalator



Cello C Escalators

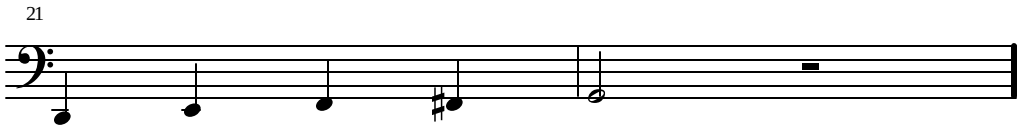
Say each of the notes of the following patterns. After saying the notes, perform the pattern on your instrument.

Open Escalator



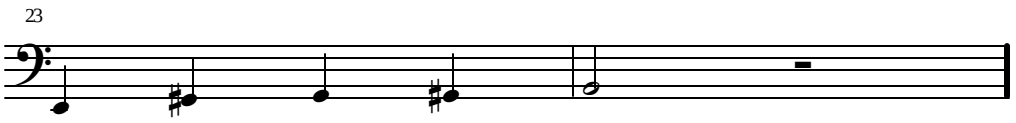
0 1 2 3 4

First Finger Escalator



1 --extend—2 3 4 --shift-- 1

Second Finger Escalator



2—extend—4--shift--1 2 3

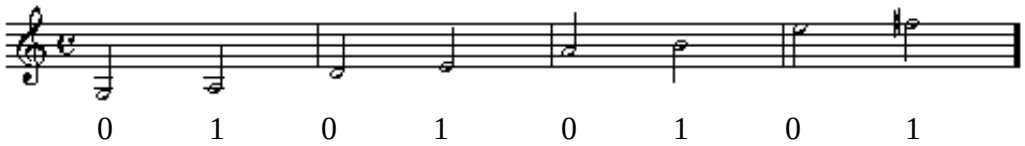
Appendix D

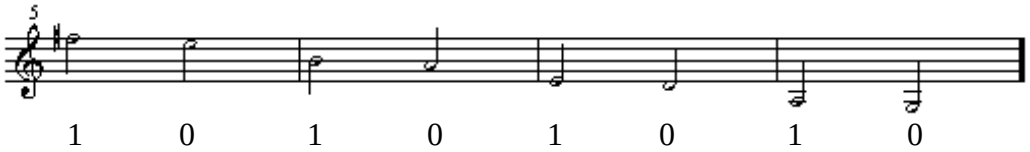
ELEVATOR WORKSHEETS

Violin Elevators

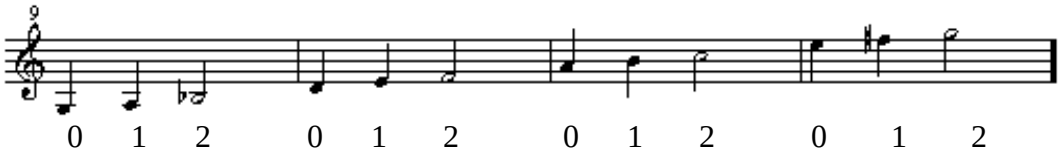
Say the notes of each elevator before performing the pattern on your instrument.

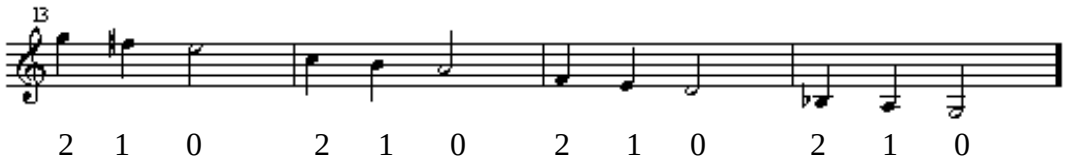
Open and First Finger Elevator





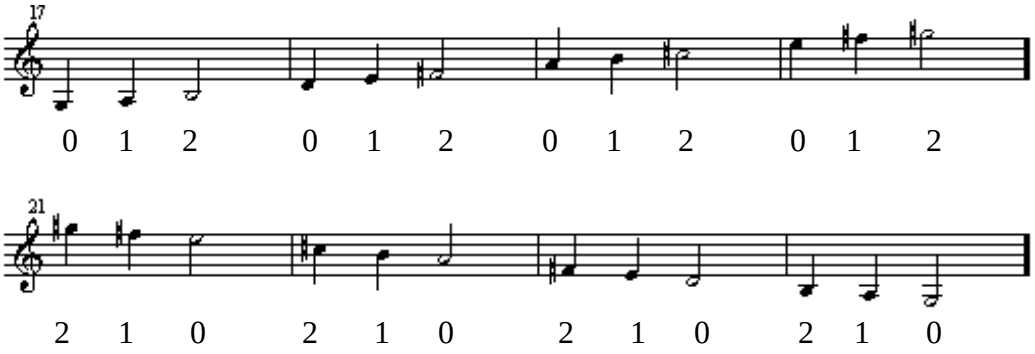
Minor Elevator (half-step between fingers 1 and 2)



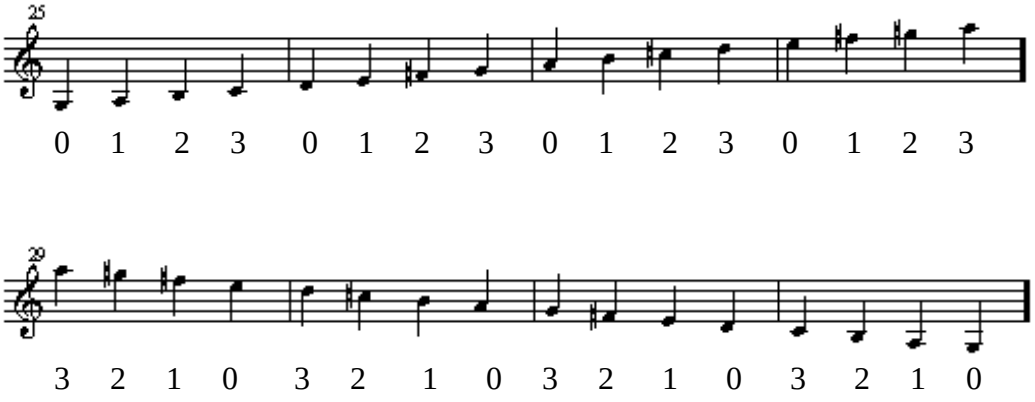


Violin Elevator Worksheet (page 2)

Major Elevator (whole step between fingers 1 and 2)



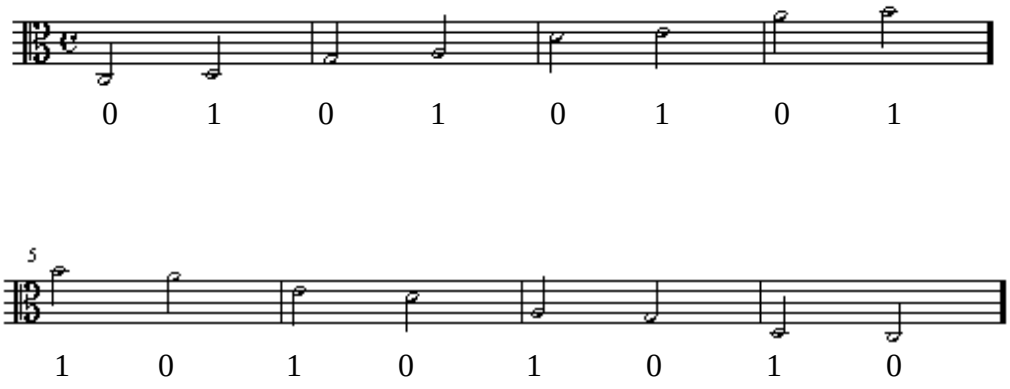
Major Tetrachord (half-step between fingers 2 and 3)



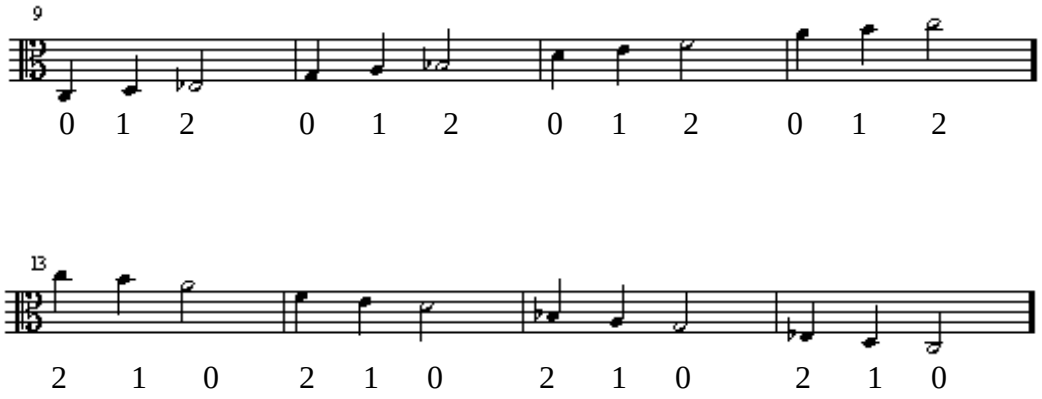
Viola Elevators

Say the notes of each elevator before performing the pattern on your instrument.

Open and First Finger Elevator

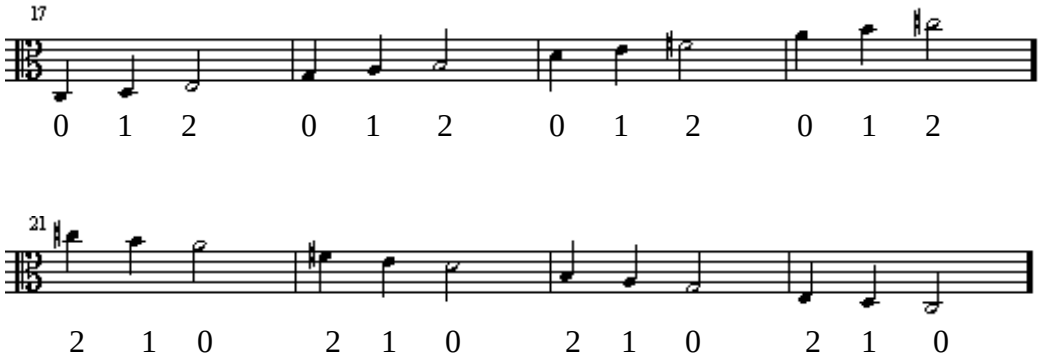


Minor Elevator (half-step between fingers 1 and 2)

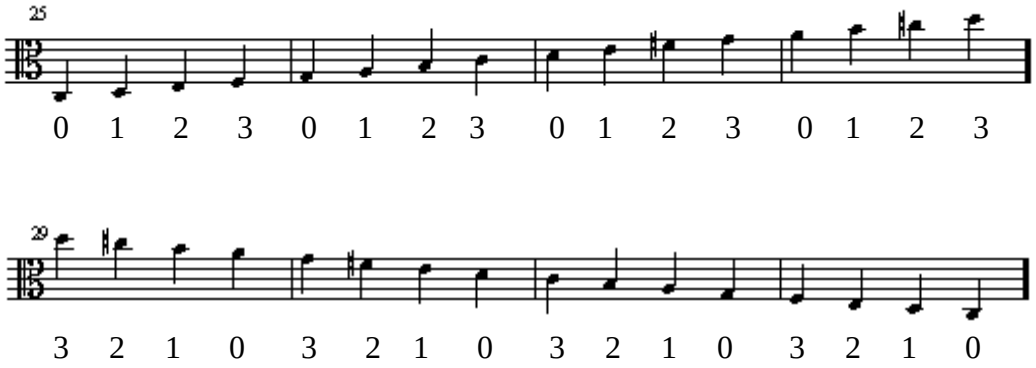


Viola Elevator Worksheet (page 2)

Major Elevator (whole step between fingers 1 and 2)



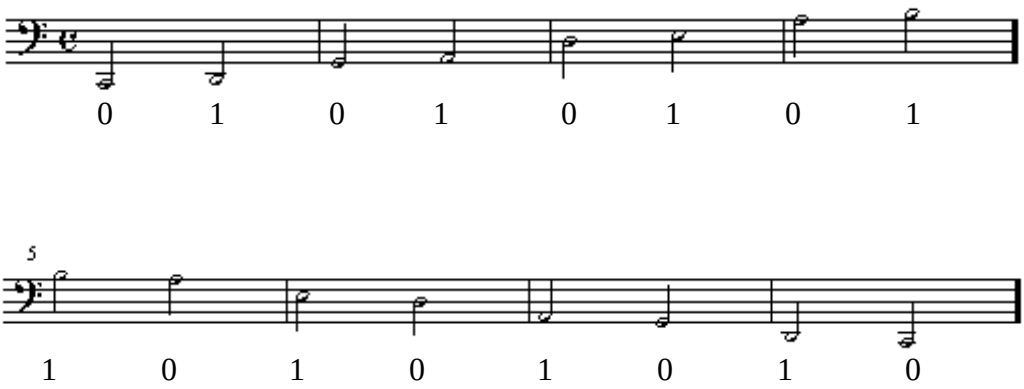
Major Tetrachord (half-step between fingers 2 and 3)



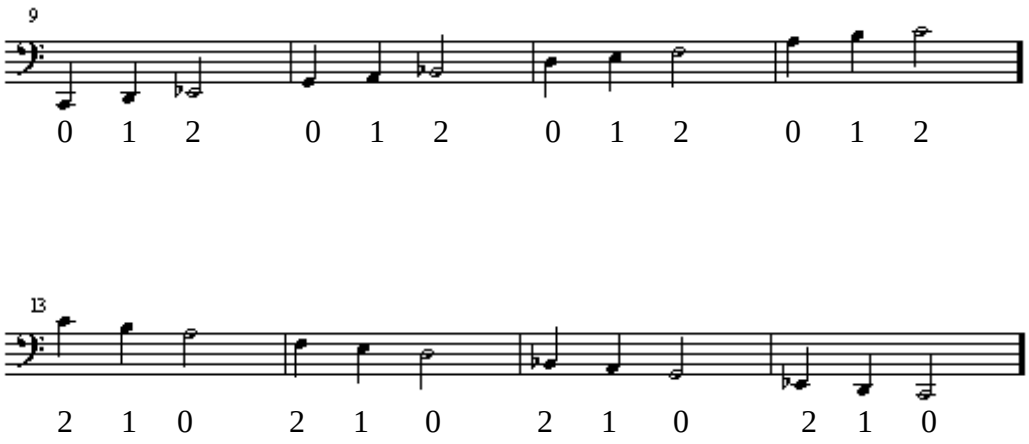
Cello Elevators

Say the notes of each elevator before performing the pattern on your instrument.

Open and First Finger Elevator

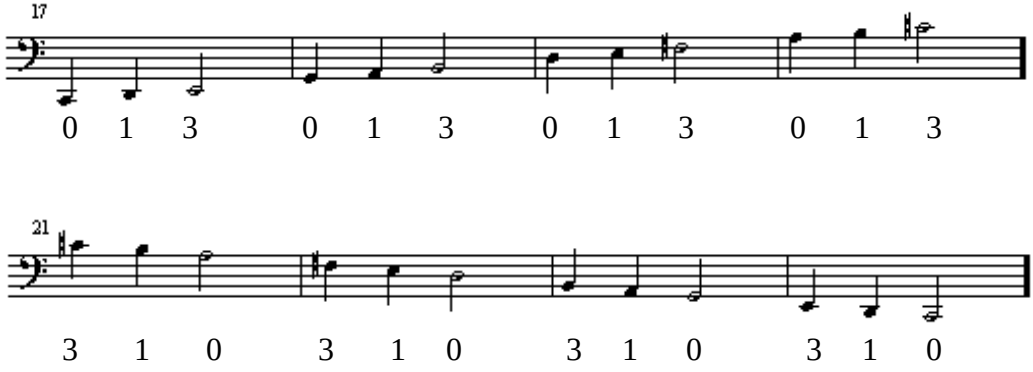


Minor Elevator (half-step between fingers 1 and 2)

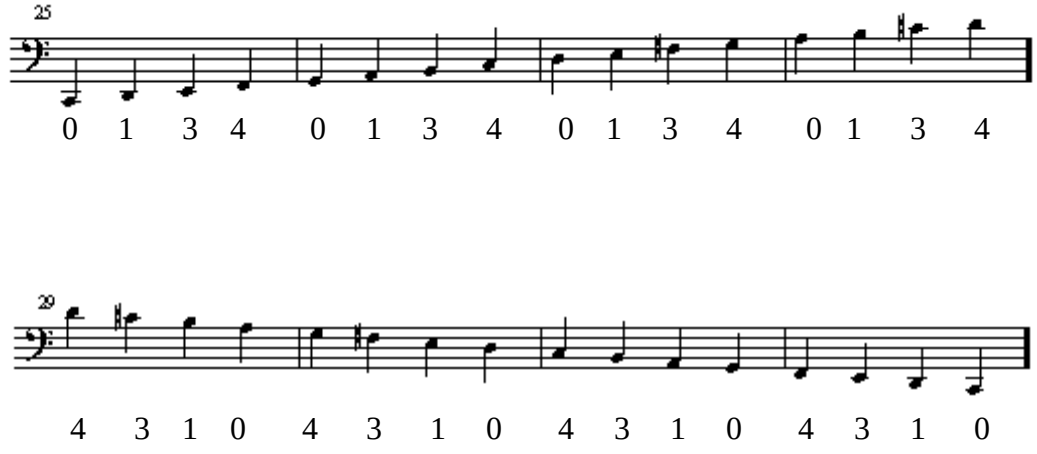


Cello Elevator Worksheet (page 2)

Major Elevator (whole step between fingers 1 and 3)



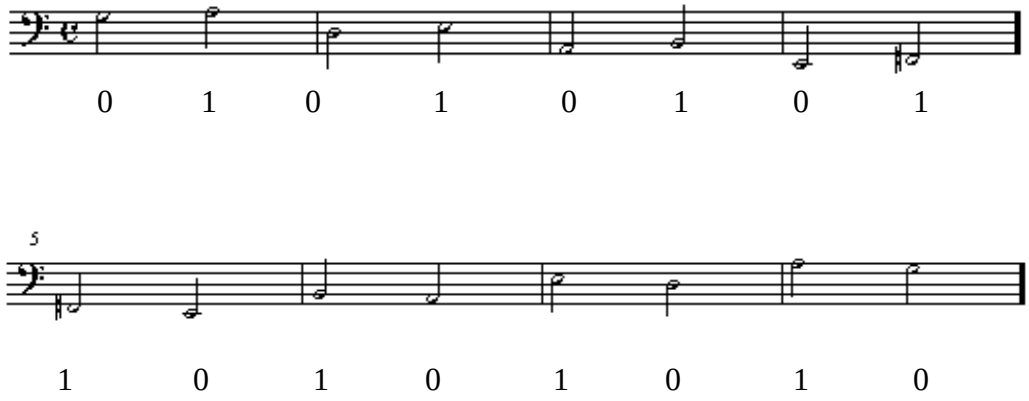
Major Tetrachord (half-step between fingers 3 and 4)



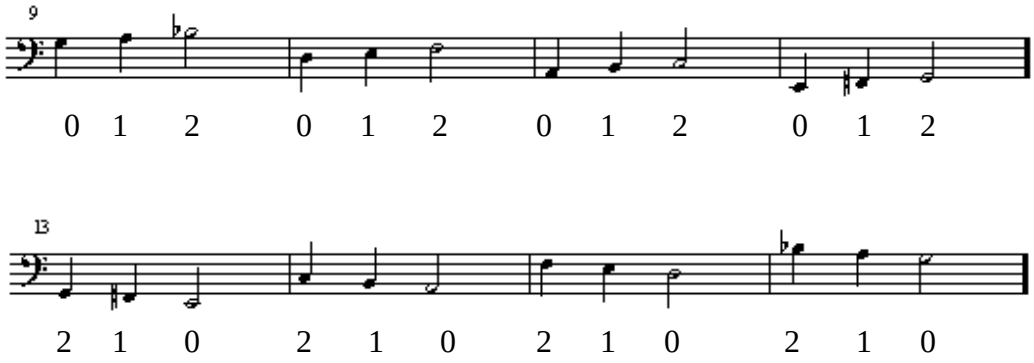
Bass Elevators

Say the notes of each elevator before performing the pattern on your instrument.

Open and First Finger Elevator

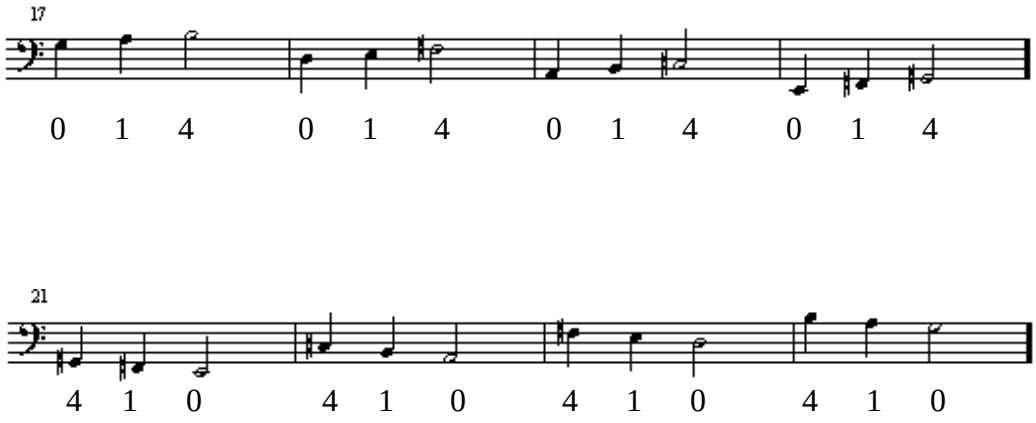


Minor Elevator (half-step between fingers 1 and 2)

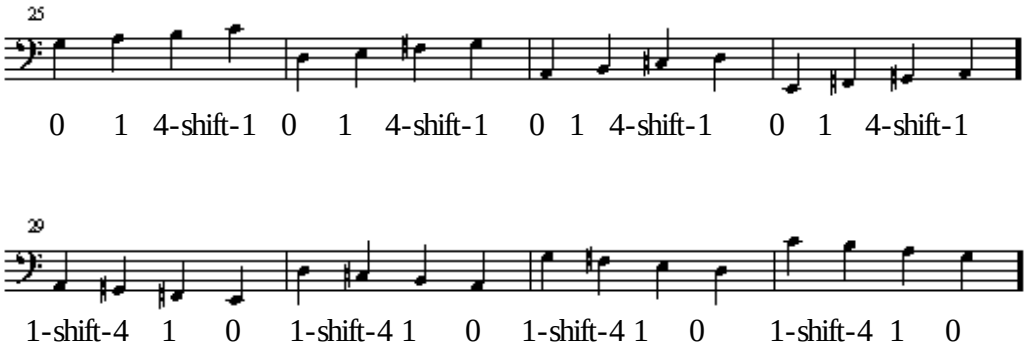


Bass Elevators Worksheet (page 2)

Major Elevator (whole step between fingers 1 and 4)



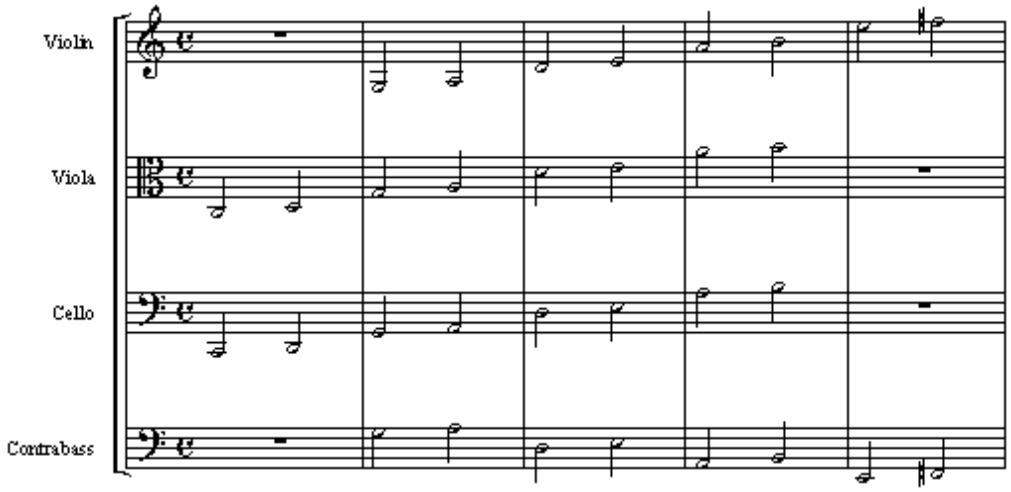
Major Tetrachord (half-step between fingers 4and 1st finger shift)

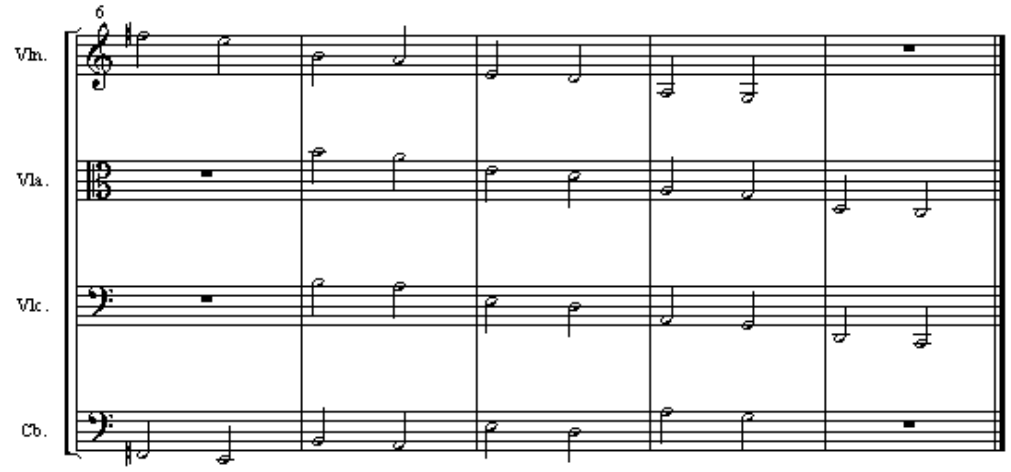


CLASS ELEVATOR EXERCISES

First Finger Elevator Class Exercise

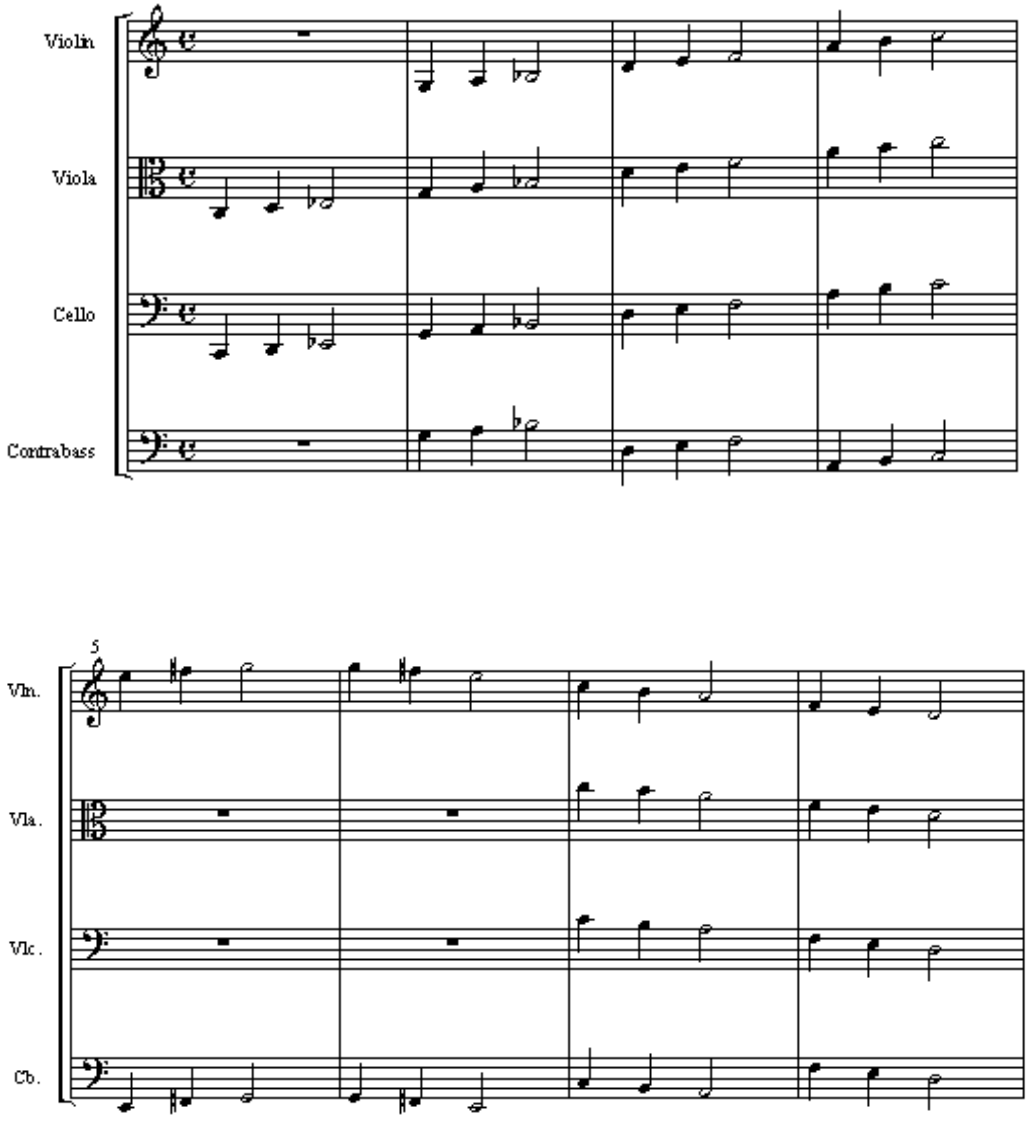
Students will name the notes in rhythm before playing on their instruments.

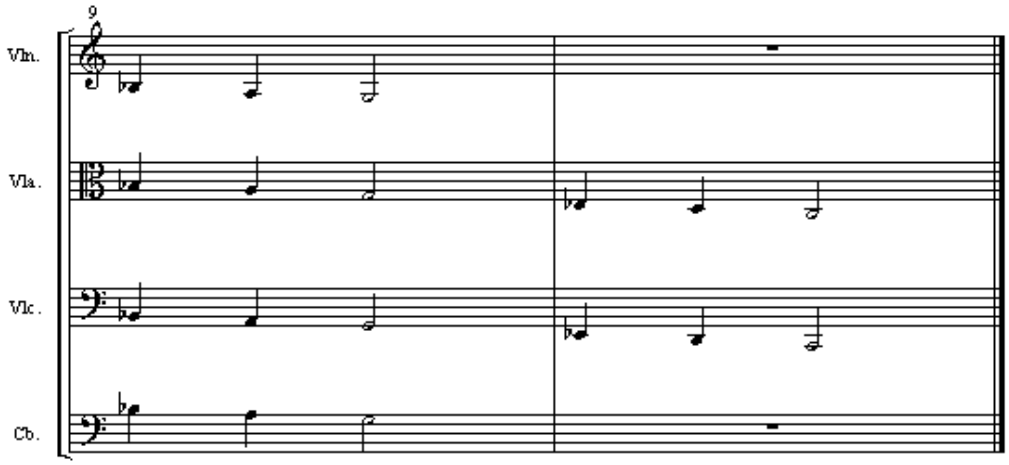




Minor Elevator Class Exercise

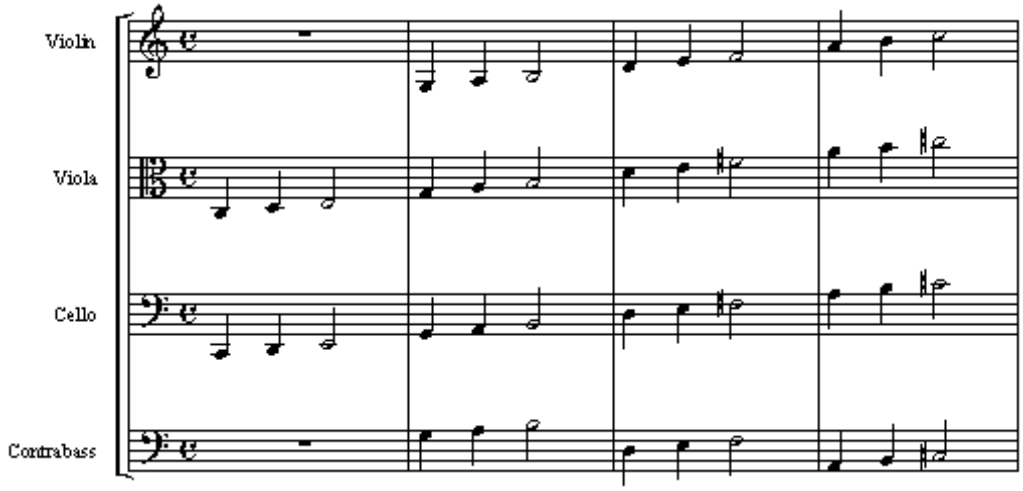
Students will name the notes in rhythm before playing on their instruments.

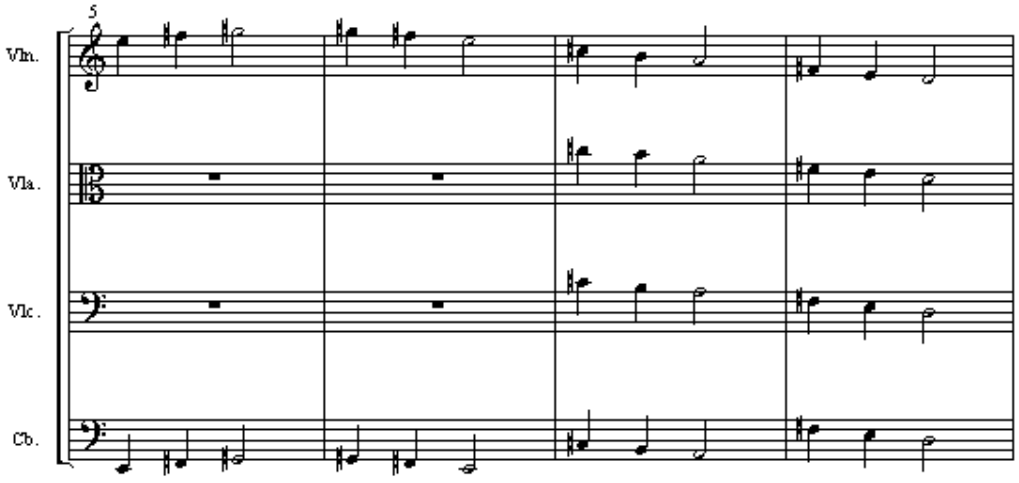


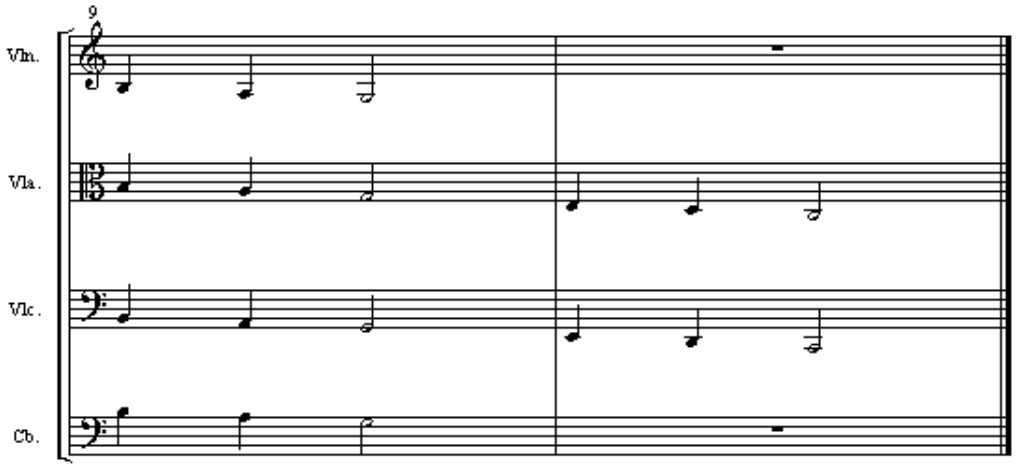

9
Vln.
Vla.
Vlc.
Cb.

Major Elevator Class Exercise

Students will name the notes in rhythm before playing on their instruments.

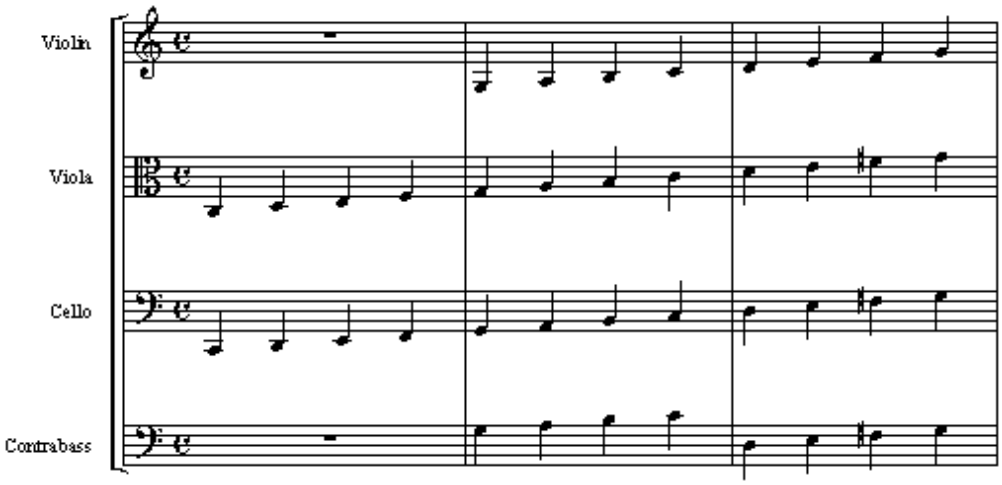


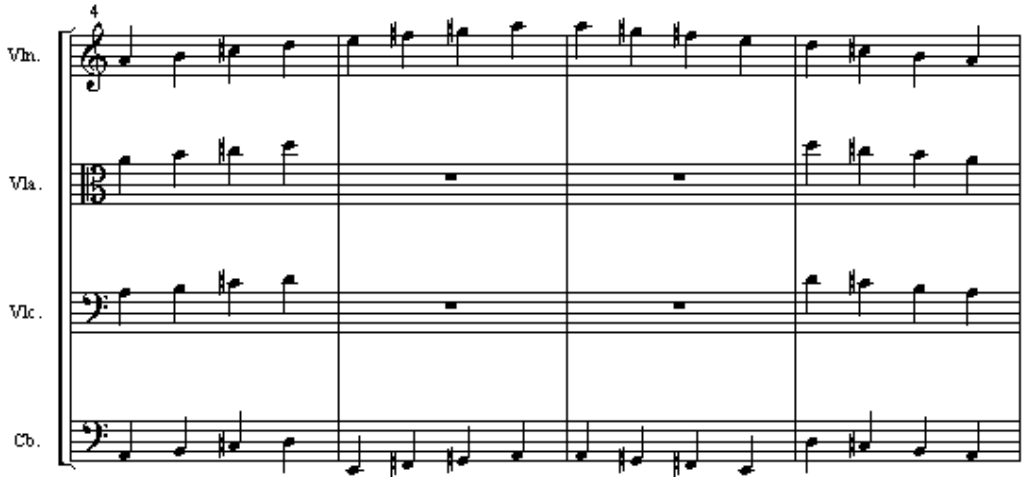


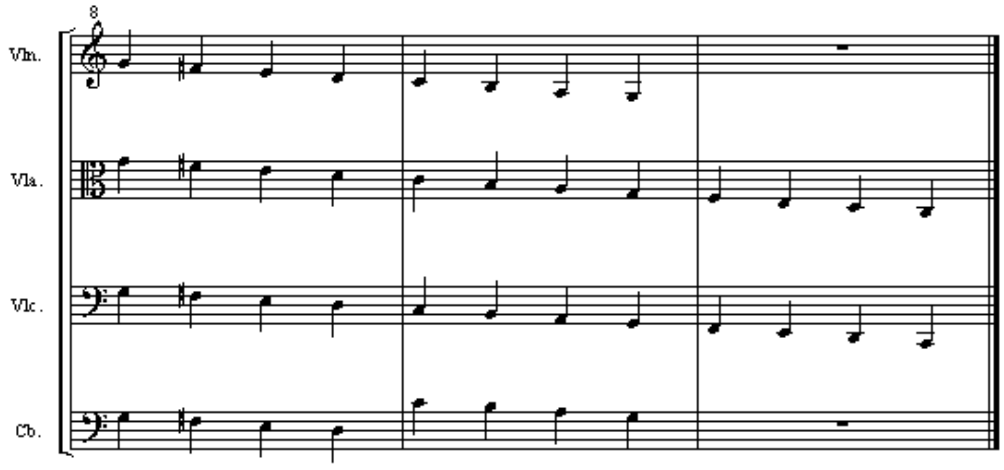

9
Vln.
Vla.
Vlc.
Cb.

Major Tetrachord Class Exercise

Students will name the notes in rhythm before playing on their instruments.






8
Vln.
Vla.
Vlc.
Cb.

Appendix E

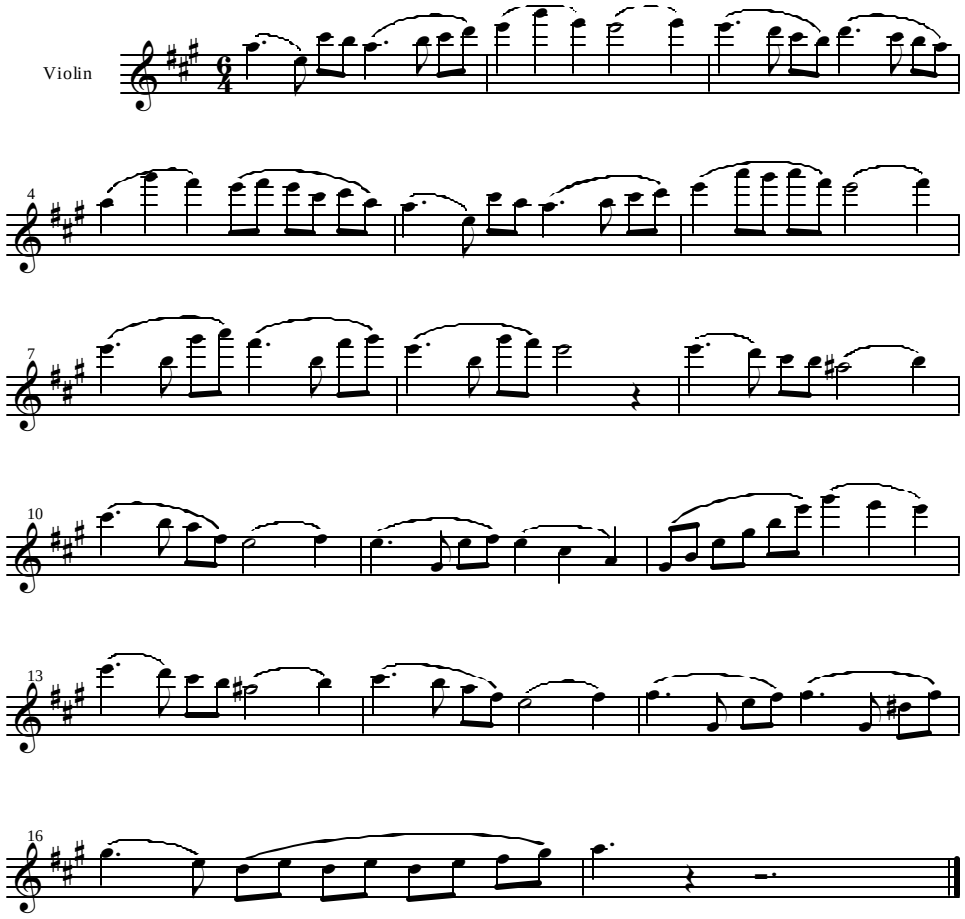
INTERVIEW QUESTIONS FOR CASE STUDY PARTICIPANTS

1. In what grade did you being playing the violin?
2. Where did you attend school when you began playing the violin?
3. At what age, did you begin taking private lessons?
4. In your development as a violinist, who have been your public school string teachers?
5. Who have been your private instructors?
6. What pieces of solo literature are you currently playing?
7. How many times were you a part of the Region Orchestra?
8. How many times were you a part of the All State Orchestra?
9. In your perception, how were you taught to choose positions that you use to play passages of music?
10. Do you try to play music all in one position or do you often shift on one string?
11. Do you choose positions for ease of performance or for stylistic purposes?

Appendix F

CASE STUDY MUSICAL EXCERPT

Hans Sitt, Op. 32, #69



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Vita

George Dwayne Wasson was born on January 14, 1967 in Pulaski, Tennessee, the son of Sandra McGee Wasson and George Fredrick Wasson. After graduating in 1985 from Giles County High School in Pulaski, he attended Tennessee Technological University in Cookeville where he received a Bachelor of Science in Music Education in June 1989. During the following years, he was employed as a classroom music teacher and string teacher in Nashville and Lawrenceburg, Tennessee. In June 1991, he entered Belmont University in Nashville where he completed a Master of Music Education in August 1992. In August of 1991, he began teaching strings at the Academy for Academics and Arts in Huntsville, Alabama. He spent eight years at this school. In August of 1996, he entered the doctoral program at University of Texas at Austin. In the fall of 1999, he began teaching in the Austin Independent School District where he is director of orchestras at Austin High School. He will remain in this position following the completion of the degree.

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This dissertation was typed by the author.